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Land and the City

Edited by George W. McCarthy, Gregory K. Ingram, and Samuel A. Moody

Land and the City

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CONTENTS

ILLUSTRATIONS

Tables

Figures

PREFACE

The majority of the world's population now lives in urban areas and depends on urban systems for housing and social and economic goods and services. This number will only increase as cities blossom and expand to accommodate new residents, particularly in developing nations. What remains unchanged, however, is the key role of cities as engines of economic growth, social activity, and cultural exchange. In an effort to support the success and sustainability of cities, this volume explores how policies regarding land use and taxation affect issues as diverse as the sustainability of local government revenues, the impacts of the foreclosure crisis, and urban resilience to climate change.

This collection, based on the Lincoln Institute of Land Policy's 2014 annual land policy conference, addresses the policies that underlie the organization, financing, and development of the world's cities. It is the final volume in the Institute's land policy conference series. Over the years, these meetings have addressed land policy as it relates to a range of topics, including local education, property rights, municipal revenues, climate change, and infrastructure.

We thank Armando Carbonell, Martim Smolka, and Joan Youngman for their advice on the selection of topics and on program design. The conference was organized by our exceptional event team, comprising Brooke Burgess, Sharon Novick, and Melissa Abraham. Our special thanks go to Emily McKeigue for her exemplary management of the production of this volume, to Peter Blaiwas for the cover design, to Nancy Benjamin for maintaining the publication schedule, and to Barbara Jatkola for her tireless and reliable copyediting.

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Land and the City

1

Introduction

George W. McCarthy and Samuel A. Moody

Although pundits noted in 2007 that for the first time in history the majority of humanity lived in urban areas, only recently have social commentators begun to discuss urbanization as a potential solution to vexing global challenges such as abject poverty and climate change. The process of urbanization has been running apace since the dawn of the Industrial Revolution. At the turn of the twentieth century, an estimated 15 percent of the world's population resided in cities. By 1960, one-third of the world's households lived in urban areas, and in 2007 the world's urban population passed the halfway mark. These inexorable shifts in human populations have transformed human culture over the past century and a half, and this transformation will continue. All projected world population growth through 2050 will be urban, by which time two-thirds of the world's people will depend on urban environments to meet their social, economic, and housing needs (UN 2014). The extent to which these needs will be met depends in many ways on the character of future urbanization. Will it continue to promote positive outcomes, such as reducing poverty, curbing population growth, or improving life expectancy? Will urbanization continue to exacerbate income and wealth inequality or growing per capita urban land use? The answers to these questions will depend on collective policy choices made in coming decades.

The character of urbanization is defined in large part by land policies, ranging from planning for development or climate change, to the collection of land-based revenues, to the provision of affordable housing or other opportunities for the advancement of urban residents. To accommodate new residents, cities will grow geographically, through both planned development and unplanned, informal settlements. From forests and freeways to cornfields and brownfields, land of all types will be settled, densified, and urbanized. The doubling of global urban populations in the next three decades will occur primarily in developing countries. Many industrial nations may see these populations age and shrink, but the

robust "return to the city" movement in the wake of the Great Recession might counteract these trends.

Cities are more than the sums of their built environments. They house people and enterprises, and they provide enabling environments for a panoply of human activities, including economic development, social interchange, athletic achievement, and cultural expression. These activities are locationally specific, and their spatial distribution offers different opportunities for residents' access. Cities approach locational and distributional problems in very different ways, including reliance on market forces, interventions designed to foster more equal opportunity, and rights-based declarations incorporated into national constitutions. While the responses may vary, in an increasingly urbanized world the question of urban equity is inescapable.

In the context of increasing urbanization and growing inequality, current urban problems will be exacerbated, while opportunities for good land use policies to improve the lives of urban populations will expand. Adequate and reliable land-based revenue streams will be needed to finance the delivery of urban services and the expansion, upgrading, and maintenance of infrastructure. The reliability of various revenue sources likely will vary with factors such as the rate of urban growth or decline, the national legal structure, and the preferences of the population. At the same time, urban areas will be subject to inexorable stresses related to climate change. A shifting climate will alter the vulnerability and value of a variety of urban spaces, both within and among cities, and the likely distribution of climate vulnerability will not be shared equally among socioeconomic strata. Climate change also will add challenges to the development and maintenance of urban infrastructure. Rising sea levels may threaten cities in coastal areas, while more severe meteorological events and natural disasters might have significant and unpredictable effects on the lives of other urban dwellers.

This volume is a product of the 9th Annual Land Policy Conference, hosted by the Lincoln Institute of Land Policy in 2014. It draws together a diverse body of work addressing a nexus of urban issues closely linked to land policy. It will be of interest to anyone involved in understanding, planning for, financing, and improving the inevitable geographic and human expansion of urban areas across the globe. The book is divided into four sections. First, it addresses the contexts in which planning for an urban future will occur: evolving demographics, expanding cities, and changing climates. Second, it explores the challenge of financing municipalities and the role of land and property taxes as own-source revenue. Third, it documents the changing state of urban housing markets, the social implications of market dynamics, and the effects of reform, both in post-recession U.S. cities and in rapidly developing Chinese cities. Finally, it assesses housing affordability and access, exploring how the determination of housing options can impact the socioeconomic, political, and educational opportunities for urban residents.

Planning for an Urban Future

The United States faces dramatic demographic shifts in the coming years. Non-Hispanic whites will lose their majority by 2043, baby boomers are rapidly aging, immigration reform is sorely needed, and everyone has an opinion on millennials. In this heady context, Myers and Lee offer a cautious overview of demographic trends and their consequences for housing and urban development between 1990 and 2030. A central question of their analysis is the strength and longevity of the effects of the 2008 recession, particularly on the millennial generation. Was this recession a game changer, permanently shaping the economic lives of millennials? Or has it merely slowed some traditional trends, such as younger people leaving the city for more family-oriented suburbs, most of which will eventually return to previous patterns? And how long will these short-term shifts last as recovery continues to flag?

Myers and Lee outline plausible scenarios for future trends in metropolitan growth rates and generational shifts in home ownership. Much depends on the ability of generational cohorts, particularly the millennials, to achieve home ownership rates comparable to those of previous generations. Myers and Lee project a series of scenarios, estimating the effect of the Great Recession on future national home ownership rates. They estimate that the impact of the years 2008–2012 on home ownership is likely to subdue the growth of suburban home ownership and continue to strengthen the revitalization of urban areas in the United States.

Whether it is microhousing for hipsters in Seattle, high-rises for the upwardly mobile in Beijing, or informal settlements on the fringe of Nairobi, the expansion of urban areas is poorly monitored around the globe. Shlomo Angel's chapter is framed by an ambitious project that monitors the global expansion of urban land. The quantitative side of this project, a collaborative effort of UN-Habitat, the Lincoln Institute of Land Policy, and the NYU Stern Urbanization Project, uses satellite imagery to measure the geographic expansion of 200 cities around the world. Angel outlines the importance of matching these data with analysis of the qualitative dimensions of urban expansion, enabling us to understand not only how fast cities are growing but also how well growth is planned. As both geographic dimensions and human populations of cities continue to expand, better planning for growth is increasingly crucial. Angel advances a policy goal for cities to prepare adequate land for urban expansion, and to secure public land for the delivery of public utilities and services *in advance of development*, in order to preempt inevitable inefficiencies that arise when urban design is left entirely to land and housing markets.

For some cities, the challenge of planning urban land use is complicated by the fact that barring serious intervention, some urban land may eventually be underwater. Climate change is increasing the exposure and vulnerability of cities and their inhabitants to extreme weather events and rising sea levels. William Solecki asserts that climatic impacts on urban spaces are dynamic and evolving.

They demand correspondingly dynamic and adaptive responses from both planners and municipal leaders. His chapter summarizes the climate challenges facing cities in the United States and the ways in which climate change has already impacted the environmental foundations under many urban areas.

Solecki notes that given their particular political and governmental contexts, U.S. cities are playing the role of early responders to climate change problems, experimenting with and implementing adaptation and mitigation strategies. However, the colossal challenges presented by climate change often demand expenditures and structural changes of such scale that federal assistance with research, financing, and technical assistance is vital. To date, policy responses have focused on the ability of cities and regions to "bounce back" after disasters. Solecki challenges policy makers at all levels to be collectively proactive—working together to implement broader, long-term adaptations with the goal of designing for flexible resiliency as both the risks of climate change and our understanding of them evolve.

Property Taxes and Municipal Finances

Responding to expanding cities, growing populations, and changing climate is an expensive proposition, and the need to respond comes at a difficult time when most local governments are burdened by financial stress. Although stable revenue flows and access to capital for infrastructure investment are particularly critical today, cities face a distressing combination of mounting historical debt, increasing costs for providing public goods and services, and diminishing revenues—legacies of the Great Recession and the housing crisis.

For U.S. cities, the property tax is the single largest source of own-source revenue, but the extent to which different cities rely on property tax revenues varies significantly. Grant Driessen and Steven Sheffrin provide a comprehensive review of the literature on the magnitude and share of property tax revenues across large cities in the United States. The authors examine municipal property tax revenues both in the context of the housing crisis and Great Recession—which struck a big blow to the fiscal health of cities across the nation—and in the context of various legislative limitations imposed on both property tax rates and assessments. These two challenges have increased pressure on municipalities either to rethink their property tax policies or to seek alternative sources of revenue. Sheffrin and Driessen explore the limited potential for increasing municipal property tax revenues in an era of mounting revenue needs and limits imposed by tax revolts.

Taking a broader approach to municipal finances, Adam Langley tackles the effects of the Great Recession on U.S. cities. The collapse of the housing market in 2008 precipitated cuts in property tax revenues as a result of declining house values. This was exacerbated by cuts in both state and federal aid necessitated by declining revenues, primarily from sales and income taxes. In addition, the financial crisis caused significant instability in the municipal bond market, the bulwark of public infrastructure financing across the country. Using data from the Lincoln

Institute's Fiscally Standardized Cities (FiSC) database, Langley documents the impact of the Great Recession on major revenue sources for local governments across the nation and their policy responses, including revenue increases, spending cuts, and the use of rainy-day funds. Langley shows that although local governments were able to weather the Great Recession itself (2007–2009), revenues and employment began to decline in 2010 and continued to do so until 2012. The longer-term effects of the recession, including delayed contributions to pension obligations, lower property values, and ongoing decreases in state and federal aid, continue to hamper local governments' return to prerecession revenue and spending levels.

Housing Finance and Markets

Turning to the root cause of much of the aforementioned municipal fiscal stress, Dan Immergluck documents the effects of foreclosures in the United States. Immergluck examines the household- and neighborhood-level impacts, as well as the spatial distribution of foreclosures across the country and within cities, by drawing on an extensive literature focused on the mortgage crisis. The unprecedented numbers of foreclosures were concentrated in neighborhoods with disproportionately high minority populations and/or high numbers of subprime loans. Immergluck traces patterns of subprime lending that targeted minority homeowners: for instance, the rate of foreclosures on first mortgages originating at the height of the subprime boom was 76 percent higher for African American families than for white families, and 71 percent higher for Hispanic families. Racially and spatially, the most vulnerable families and neighborhoods bore the brunt of the subprime-induced foreclosure crisis. The concentration of foreclosures in small areas intensified negative effects at both the household level (financial condition, health, and schooling) and the neighborhood level (property values and crime). Importantly, Immergluck found that many of these negative impacts spilled over to affect even those not involved in the mortgage transactions. He suggests that state and local governments have a role to play in counteracting—or preventing—the consequences of spatially concentrated subprime lending and subsequent foreclosures.

At the federal level, the reform of government-sponsored housing finance entities has dominated efforts to prevent another housing crisis. Laurie Goodman presents a realistic assessment of the state of housing finance reform in 2014. She focuses on the conservatorship and reform of Fannie Mae and Freddie Mac and the efforts to expand the role and responsibility of private capital in such government-sponsored enterprises (GSEs). Examining the history of GSEs, Goodman explores the implications of various legislative options and traces the administrative reforms that have been accomplished by the Federal Housing Finance Agency. Six years into this process, she found limited impact of the reforms. In 2014, the federal government essentially still guaranteed 85 percent of new mortgage debt, and credit availability remained extremely limited.

Goodman questions whether new mortgage instruments will, or can, emerge to protect consumers from undue risk, or whether the housing finance system will evolve to meet the needs of an increasing—and increasingly diverse—population of prospective homeowners.

In an entirely different context, government housing finance reform in China has been a key element of the booming Chinese housing market. In 1998, the Chinese government ended its socialistic system of housing provision and introduced private housing markets. This sparked a long period of rapid real estate development and urban growth. Separation of land ownership and use rights facilitated the rapid development of Chinese land markets, increasing home ownership, and fast-paced urban growth. Joyce Man examines the evolution of Chinese housing policies and the growth of the Chinese housing market since the reforms. Throughout this period, Chinese cities have increasingly relied on land leasing fees as a primary source of revenue. In recent years, however, growing demand for housing and more sophisticated housing markets have capitalized land leasing fees into housing prices, reducing the availability of affordable housing. Man argues that municipal reliance on land leasing fees must be reduced in favor of a new property tax system in order to help stabilize the market and ensure access to affordable housing in Chinese cities.

Housing Policy and Segregation

Access and opportunity are tied in many different ways to location. One's neighborhood and neighbors can have dramatic effects on health and political, socioeconomic, and education opportunities and outcomes. The Tiebout model of residential sorting proposes that mobile households choose between various neighborhoods to find the "package" of public services and taxes that is most appealing to them. Families with children may opt for higher property taxes to fund better schools, while single professionals may choose a better public transport system in lieu of excellent schools. A resident's ability to pay for a desired package of services—a system often regulated through land-based policies—is key to this model. For example, zoning rules can require minimum lot sizes, thereby establishing a minimum property tax level for residents of a certain area and effectively setting a minimum price for public services there. Thus, the question of who can afford to live where and with whom is an important issue to address when determining land and housing policies.

Across Latin America, where traditional arrangements between private real estate developers and government-sponsored mortgage banks fail to provide adequate affordable housing, households resort to a variety of informal housing markets. Eduardo Rojas summarizes a selection of housing policies and outcomes across Latin America, assessing various government interventions focused on demand-side interventions and supply-side subsidies targeted to households. In addition to increasing the supply of affordable housing units, a particular challenge Latin American policy makers face is the need to upgrade or "formal-

ize" the growing number of existing informal housing units. Upgrading informal housing, which can account for a significant portion of a city's housing stock, also requires a big investment in order to deliver necessary infrastructure and public services to informal—and therefore unplanned—neighborhoods. Policies to improve the quality of life in Latin America's growing cities face the challenge of looking beyond bricks and mortar to the full array of services required by households—services that are provided by the house itself, the neighborhood, and the city.

Given the history of racial segregation in the United States, it is not surprising that most studies of segregation in this country focus on the issue of race. However, Evan McKenzie, as well as Anna Chmielewski and Corey Savage, look at socioeconomic segregation in slightly different ways: the rise of common interest housing (McKenzie) and a comparison of socioeconomic segregation in the United States and Latin America, measured through school data.

The relationship between the increase in residential segregation by income and wealth and the increase in income inequality is a well-documented trend in the United States. Research findings concur with the Tiebout model: as people's economic fortunes diverge, their opportunities grow or shrink, and groups with greater or lesser resources find themselves living in different neighborhoods with different lifestyles. To more fully explain this relationship, McKenzie introduces a third trend, the rise of common interest housing, which takes the form of private homeowners' associations, condominiums, and housing cooperatives—perhaps more commonly thought of as "gated communities." McKenzie reveals that common interest housing is a complicating factor in the relationship between income inequality and socioeconomic segregation. Ultimately, he concludes that common interest housing is simply a tool for real estate development, public policy, and consumer choice—and as such, responsibility for its impacts rests with developers, policy makers, and the consumers who use it.

Given the general reliance of school finances on property taxes in the United States, the links between residential location and educational opportunity can be quite strong—a topic explored at the Lincoln Institute's 2013 Land Policy Conference on Education, Land, and Location (Ingram and Kenyon 2014). Anna Chmielewski and Corey Savage link trends in inequality and segregation in an international context by comparing rates of socioeconomic segregation in U.S. schools with those of several Latin American countries. Their findings document the high rates of socioeconomic segregation across Latin America, where educational systems are generally dominated by small schools and school choice.

Conclusions

The land beneath our cities—and the policies that regulate it—shape the character of human settlements. This is a critical awareness for a rapidly urbanizing planet. Land is, quite literally, foundational to the development of productive, sustainable, and equitable cities. The studies presented in this volume touch on a

diverse set of themes, all connected to the relationship between land use policies and successful and sustainable urbanization. They explore strategies for protecting cities from flooding and for reforming two massive government housing finance agencies. They examine efforts to ensure access to affordable housing and public services and the fiscal challenges facing the cities that pay for them. They argue for the importance of monitoring both the expansion of urban development across the planet and the impact of vacant homes on neighborhoods. Above all, the editors of this volume hope that these studies will help policy makers and urban citizens alike recognize the profound ways in which land policies shape not only the cities we build but also the lives of those who reside in them.

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Urban Planning

2

Demographic Change and Future Urban Development

Dowell Myers and Hyojung Lee

The future course of population change, housing, and urban development has rarely, if ever, been so uncertain. The United States is still seeking a new normal after the deepest recession with the longest-lasting effects since the Great Depression. What makes this all so confusing is that short-term adjustments are overlaid on longer-acting trends, and the interplay between the two is uncertain, especially as the long-anticipated recovery continues to be delayed. Are the recession-derived behaviors the new normal? Will everything revert to long-term trends by the end of this decade? Or is a new mind-set being incubated that will remake the long term even after full recovery?

In the absence of hard data about the future, science is extremely limited in what it can explain. In the vacuum, many interpretations are being offered, some focusing on the near term and others extrapolating to the decades ahead. An irony of the dialogue is that, with some regularity, the most vocal urban observers interpret the postrecession behavior as evidence in support of exactly the same policy changes they advocated before the recession. Clearly, the longer-term trends are of crucial importance, with the recession effects either simply a diversion or an underscore. Sorting out these effects is difficult, but this chapter seeks to shed light on the matter.

The chapter is divided into two parts—a broad overview and then a discussion of three key topics. The overview addresses various trends and their interactions, as well as the dilemmas presented by attempting to predict the always uncertain future, especially in light of the massive disruptions caused by the Great Recession and its many ensuing behavioral adjustments. Short-term

effects resulting from the recession have combined with other, longer-running or preordained trends, such as age structure shifts, making predictions of the future of urban development even more confusing.

Following this substantial overview, three key topics receive particular attention. First are the fundamental demographic changes reshaping society and the urban development required to accommodate the growing U.S. population. Special attention is given to two groups that are the primary drivers of urban change: young adults under age 35, including the millennial generation, and seniors over age 65. The young represent a source of potential new households and home buyers, and they also carry new generational preferences. In contrast, the seniors hold established, long-settled positions that will be surrendered to the younger generation over the next two decades. They also possess a storehouse of owner-occupied housing awaiting resale.

The second topic for close inspection is the recent shift in locational growth within the nation's metropolitan areas. How intrametropolitan patterns will change in the coming decades is unknown, but close examination of the changes over the past two decades in the top 50 metropolitan areas can provide insight into how locational preferences may be shifting, particularly for young adults under age 35 who are college educated. This chapter presents evidence that can be used to scrutinize the inward and outward shifts of these different groups within the large metropolitan regions that are home to more than half of the U.S. population.

Finally, the chapter presents a reasoned projection of the future trends in home ownership, the fundamental tenure division (owners and renters) within the stock of households that underlies other patterns of urban development. The method used to examine this topic is a proposed generational momentum model that exploits the temporal regularities of cohort accumulation of home ownership over time. We have constructed alternative scenarios based on recent and past precedents that we think might better inform policy choices. This outlook underscores a powerful generational momentum already in progress, with a well-advantaged older generation passing into retirement that is increasingly separated from a lagging younger generation that is struggling to achieve first-time home ownership. The success of the millennials in particular is a vital component of the housing market, and policy makers would be well served to pay much greater attention to this group.

Overview of Issues

QUESTIONS ABOUT CHANGES IN DEMOGRAPHICS

In answering questions about a new urban America, some of the most reliable—albeit still uncertain—evidence to explore is the United States' changing demographics. A complicating factor is that so many changes are taking place at once.

The "next America," as many have called it,[1] will be more racially and ethnically diverse, containing more immigrants and their children, and it will face profound changes in age structure and lifestyle. The baby boomers will be entering their retirement years, leading to a new experience of massive graying in America. Meanwhile, population growth in the prime middle-age years will all but cease, and working-age population growth will depend wholly on the diverse younger generation, much of it derived from immigrants (Myers, Levy, and Pitkin 2013). Demographic projections by age and race, as uncertain as they can be, are among the best data that inform the future.

At the same time, family lifestyles are also changing. Children are becoming less numerous because fertility continues to run below replacement levels, even though the deficits are not as deep in the United States as in Europe and Asia. Fewer children per woman is part of the new family lifestyle. Women's participation in the labor force is approaching men's, while their education levels have surged ahead of men's. The newfound acceptance of same-sex marriage marks a broader trend toward normalizing the diversity of alternative family lifestyles. The great majority of people will live in housing units in urban settlements, and their diverse lifestyles will surely impact locational preferences and future urban growth patterns. The United States last encountered such large demographic changes in the 1970s, when the baby boomers were coming of age, causing the American planner and economist William Alonso late in his career to focus on "the population factor" (Alonso 1980). Changing demographics involve so many factors of potential interest that they can be bewildering in variety. The foundational themes that are best documented and have the broadest consequences are addressed later in this chapter.

SURPRISING NEW TRENDS IN LOCATIONAL PREFERENCES

The strongest potential indication of changing urban preferences follows from the latest trends reported each year by the U.S. Census Bureau as estimates of net changes in population. The trends that have followed in the wake of the Great Recession reveal some startling shifts. Between 2010 and 2013, big cities saw their populations grow for the first time in decades (Roberts 2014b), and large metropolitan areas began to grow faster than smaller ones (Florida 2014). The *New York Times* even reported a surprising racial shift in New York, with the white, non-Hispanic population growing in number, contrary to past assumptions of the continued decline that began in the 1960s (Roberts 2014a). All these

1. See *The Next America* by Paul Taylor of the Pew Research Center (Taylor 2014); the Next America, a continuing project on Next America directed by Ronald Brownstein at the *National Journal* (*www.nationaljournal.com/next-america*); and *America's Tomorrow*, a newsletter produced by PolicyLink (*www.policylink.org/focus-areas/equitable-economy/americas-tomorrow-newsletters*).

trends would be truly remarkable if they were to persist for the next decade or more.

The new popularity of cities has generated major competition between old and new groups for the same housing in older city neighborhoods. These neighborhoods have enjoyed resurgent growth, and no matter the public benefits of bringing the middle class back into the core of the city (Birch 2012), this is often accompanied by rampant gentrification, which has been spawned by college-educated families outbidding working-class families for property, thus squeezing the latter into the outer suburbs, where housing is now cheaper. The process has led to an "inversion" that is said to be turning cities inside out (Ehrenhalt 2013).

How well do these postrecession trends foretell the future? The flood of young people moving into cities might be due to new preferences, or it might just be a quirk of demographics and temporality, not an indication of future trends. Demographers have been cautious about inferring new preferences from current data. Many have observed that the recession and its aftermath have slowed the normal life-cycle progress of young adults, delaying marriage and childbearing. As a result, the out-movement of people ready to take advantage of better housing opportunities may have only been delayed, with the recession bottling them up in urban districts on a temporary basis (Johnson, Winkler, and Rogers 2013). Consistent with the delay thesis, employment progress also has been stalled, and with economic prospects so uncertain, young adults have remained in their parents' homes or in shared starter apartments longer than expected.

Meanwhile, the inflow of young people has been escalating. The number graduating from college and launching into adulthood has continued apace, but the millennial generation is also larger than its predecessor, the number of births per year having risen steadily from 3.14 million in 1975 to 3.61 million in 1980 and 4.16 million in 1990, before falling off to 3.90 million in 1995 (Martin et al. 2013). This indicates that the number of native-born adults arriving at age 25 will grow until 2015, after which the wave will advance to age 35, cresting in 2025. (The added effects of immigrants are considered later in this chapter.)

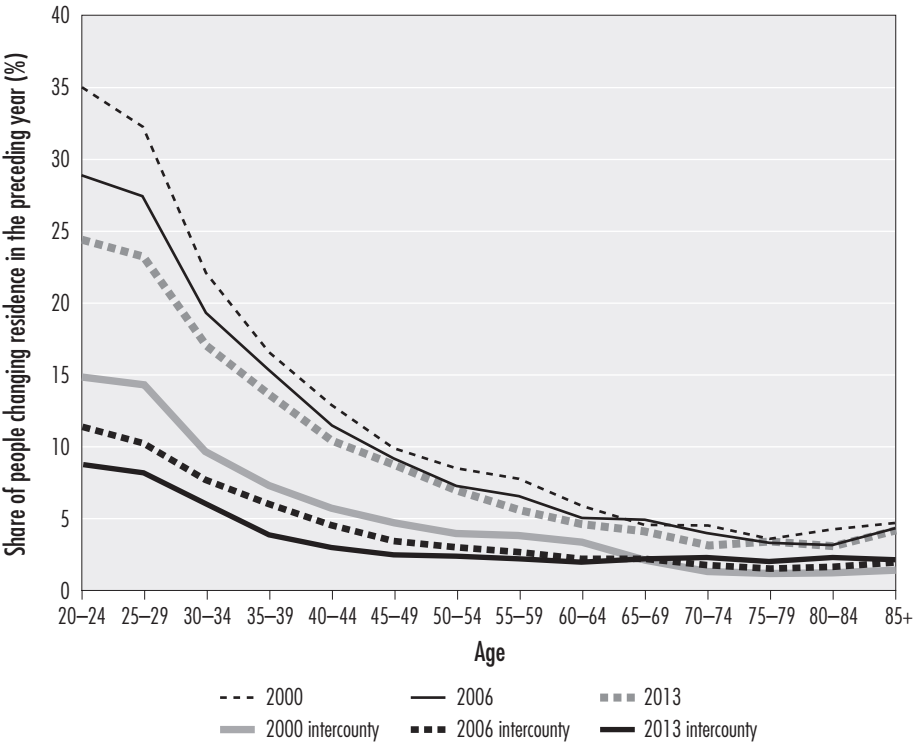
The demographic explanation for recent urban resurgence is, therefore, simply that the larger size of the millennial generation would, under any circumstances, be expected to raise the population in urban districts serving twenty-somethings. However, the impact of this growing inflow has been compounded by the slowing outflow resulting from the recession. These factors have in good part led to strong city growth and increasing vitality of many urban neighborhoods. The question is whether the millennials will remain in those places when they are five to ten years older, or whether a pent-up wave of out-movers is waiting to be unleashed on new housing destinations.

These dramatic short-range adjustments are appearing in the context of a long-standing trend toward a slower pace of geographic relocation. Prior to the mid-1980s, about 20 percent of the U.S. population moved to a new residence in a given year. Ever since then, the annual rate of geographic mobility has fallen steadily, reaching 13.7 percent in 2006 and 11.7 percent in 2013. In fact, mobil-

ity is much more common among young people than old, and so the overall aging of the population has contributed to the general slowdown. An additional reduction in mobility has been observed within each age group, however. More of the slowdown appears to have occurred in long-distance mobility (intercounty), which is often job or lifestyle motivated, although the slowdown also has included local mobility.

Figure 2.1 provides a detailed picture of the slowing relocation by age and distance. Even though relocation remains far more frequent among the young, the reduction in geographic mobility from 2000 to 2013 appears to have been greatest among young people. Further, the slowdown before the recession, from 2000 to 2006, appears to have been just as great as after it. The reduction in geographic relocation is a long-standing trend that has eluded clear explanation (Frey 2009; Molloy, Smith, and Wozniak 2011), and now it has been complicated by its interaction with the Great Recession and its aftermath.

Figure 2.1
Geographic Mobility by Age Group, 2000, 2006, and 2013



Sources: U.S. Census Bureau (2005a); data from Current Population Survey, Annual Social and Economic Supplement, U.S. Census Bureau, selected years.

Urban commentators have ascribed many meanings to the changes in geographic relocation, even if social scientists have no clear explanations for the slowdown. A popular thesis is that whatever is growing must be preferred, even if the new trend suggests a wildly different preference than before. Though tempting, it may be premature to claim a bold new future based on this moment of temporary adjustment. A more cautious interpretation would be the aforementioned demographic thesis that population movements have simply been delayed, bottling people up in old locations that they will vacate as soon as full recovery is achieved. Nonetheless, even under the demographic thesis, it would be foolish to assume that urban behavior will completely return to what it was before the recession and that nothing has changed from the seven-year experience of deep recession and delayed recovery. The future likely will comprise some mix of long-term trends and recent changes.

UNCERTAIN TRENDS IN HOME OWNERSHIP FOLLOWING THE GREAT RECESSION

Among the most significant trends shaping the course of future urban development is home ownership. The reputed "American dream," which entails the desire for home ownership, has fueled suburbanization and expansion of the metropolitan fringe ever since Brooklyn became the first suburb in the United States (Jackson 1987). The devastating housing market crash following 2007—the first nationwide downturn in house values since the Great Depression—potentially marked the end of post–World War II urban expansion. Certainly, geographic mobility has slowed dramatically, and it seems that a turning point might have been reached.

The housing market crash had traumatic effects on millions of Americans, both participants and observers. Fully 4.4 million homeowners lost their homes through foreclosure between 2007 and 2013 (CoreLogic 2013; Immergluck 2011). A far greater number suffered a loss of home equity that threatened their personal well-being. As of May 2014, 12.7 percent of homes were valued lower than their mortgage balances (making them "underwater"), and another 20.6 percent were "under-equitied," meaning their owners were effectively locked in place because their slim home equity was insufficient to cover the transaction costs of selling their current home and buying a different one (CoreLogic 2014). Upwardly mobile minorities and young adults suffered the greatest losses, driving them back to the bottom (Kochhar, Fry, and Taylor 2011) and casting doubt, for the present at least, on home ownership's future role as an escalator into the middle class.

The group with the greatest potential to remake urban America is the rising millennial generation. Not only are they the most numerous group since the baby boomers, but they are also at the life stage where generations are most open to social change (Ryder 1965). Young people are the ones most likely to choose urban, rather than suburban, locations, and they may be incubating new values regarding home ownership and sustainable urban lifestyles. The financial crisis

that began in 2007 has dominated all of their adult years, and the longer a full recovery from the recession is delayed, the more the lifestyles they have adopted could become entrenched as the new normal. In fact, blog writers and national commentators have advised millennials that based on the recent traumas, home ownership might be an unwise venture, that renting is surely a safer course for life. Even though the public continues to express resilient support for home ownership, as reflected in the periodic surveys by Fannie Mae,[2] opinion leaders from the millennial generation remain suspicious and urge caution (Rampell 2014).

The plunging rate of home ownership has become the subject of contentious assessment. On one hand, this decline and the growing number of renters have been taken as clear evidence that home ownership has lost its value and ceased its role as the centerpiece of urban settlement. Between 1970 and 2000, the home ownership rate remained fairly steady at around 64 percent of households, but after 1995 it surged upward, peaking in 2004 at 69.2 percent. Since 2008, the home ownership rate has fallen steadily, by about half a percentage point per year, reaching 63.9 percent in the final quarter of 2014, thus erasing all the gains since 1995.[3] The question remains how much further will the home ownership rate fall.

On the other hand, a prevalent optimistic assumption among housing experts is that the decline is due to be stemmed, largely because the home ownership rate has returned to its long-term normal level of about 64 percent (Gabriel and Rosenthal 2015; McCue 2014). This view is supported by quantitative projections that hold constant current conditions. But those projections assume there will be no long-term effects of the housing bubble and crash, or that the struggling younger generation can be as successful as the younger baby boomers. A worrisome generational momentum has been set in motion, however, with younger adults falling well behind their predecessors.

The risk is that experts have an overly optimistic view of the health of the housing market. As discussed later in this chapter, a more realistic view of the future is required so that policy makers will understand the need to support the struggling generations, whose participation is needed to bolster the weakened housing market. Optimism about the future of that market may be justified only if corrective measures are taken to help first-time buyers.

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2. Among young renters, according to the 2014 Fannie Mae National Housing Survey, fully 76 percent think that owning a home makes more financial sense than renting, 49 percent say they will buy the next time they move, and 90 percent say they will buy at some point (Fannie Mae 2014).

3. These trends are derived from the U.S. Census Bureau's Housing Vacancy Survey (HVS) (U.S. Census Bureau 2014). The rates derived from the traditional decennial census and the annual American Community Survey launched in 2005 run around two percentage points lower.

CHALLENGES IN PROJECTING FUTURE OUTCOMES IN URBAN DEVELOPMENT

As much as the Great Recession might have disrupted lives and led to a potential "great reset" of urban behavior (Florida 2011), analysts should be cautious about overextending the present recession effects into the future. The surest statement about the recession and its aftermath is that these events have disrupted normal behavior patterns and slowed typical movements or transitions. We suggest that an additional meaning of *reset* following a recession is simply the effect of the synchronization of behavior changes of many actors. All have been disrupted simultaneously and may respond to the same cues about resuming their desired behavior. With synchronization, that resumption could have a powerful impact, as occurred immediately after World War II.

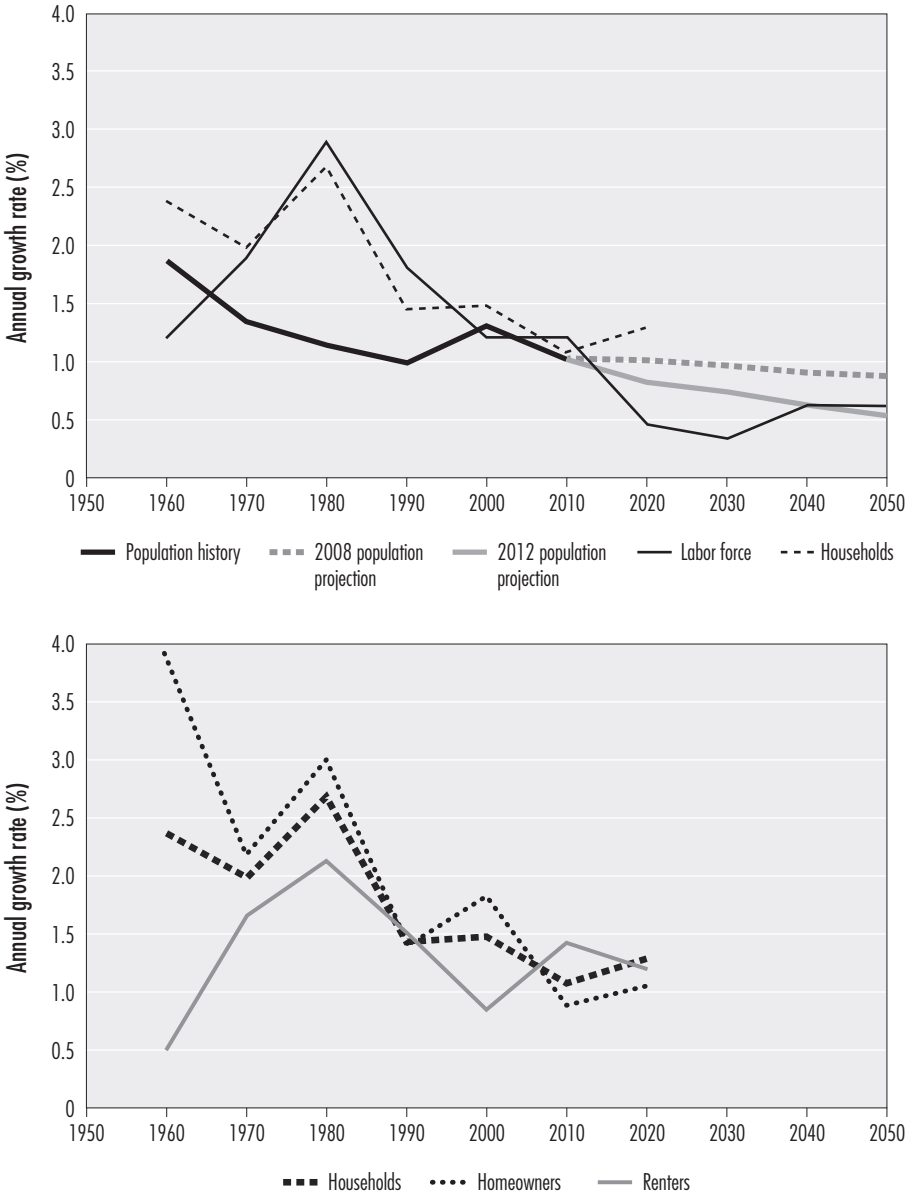
Implications for future development are summarized best through projections that balance many contributing factors. The usefulness of all projections, however, is not their spot predictions, but how well they inform decision making. Projections reveal the implied outcomes of their supporting trends and assumptions. A well-chosen set of assumptions can help define the envelope of possible outcomes, giving a balanced picture of the context that supports judgments of alternative outcomes. When conditions are especially uncertain, planners in business and public agencies have learned to construct different scenarios based on alternative sets of supporting conditions, including alternative policy arrangements and different market conditions (Myers and Kitsuse 2000; Schwartz 1997).

Limited Data Unfortunately, in making these assessments, planners have access to little future-based data. The only long-term projections that are generally considered reliable are population projections prepared by the U.S. Census Bureau or labor force projections prepared by the Bureau of Labor Statistics, both pertaining only to the nation as a whole. There are few projections for housing and virtually none for urban growth and development.[4] However, it is possible to construct custom projections that are rooted in the limited data available.

Long-term trends of past and future growth are summarized in figure 2.2, showing the steep slowdown that has been under way in the United States since 1980 and even earlier. The slowing rate of population growth and changing age structure have had serious consequences for the labor force, which surged to a peak when the baby boomers flooded the job market in the 1970s but has progressively tailed off since then. In fact, Thomas Piketty (2014) has described the long-term slowdown in population growth as one of the key drivers of slower economic growth across the developed world (leading to greater weight being placed on capital than on labor). This weakening of the demographic

4. Only two detailed housing projections have been produced since the Great Recession (McCue 2014; Myers and Pitkin 2013). No postrecession quantitative projections of urban growth are known to exist at present.

Figure 2.2
Annual Growth Rates for Population, Labor Force, and Housing, 1950–2050



Note: Annualized growth rates are computed for the decade ending in the date shown.
Sources: U.S. Census Bureau (2008, 2012a); Decennial Census 1950–2010, U.S. Census Bureau; Toossi (2006); McCue (2014); Myers and Pitkin (2013).

underpinning in the United States is hampering recovery from the recent recession and led the Council of Economic Advisers (2014) to issue a report that thoroughly dissects the long-term labor force trend, whose decline is compounded by more factors than aging alone. Nonetheless, a Bureau of Labor Statistics study concluded that the faltering labor force growth is currently the major constraint on reviving economic growth (Woodward 2013). Others might fault cutbacks in consumer spending or the sluggish revival of home construction, but those two factors also are undergirded by slowing population growth, especially in ages 25–44. Housing growth is so important to future urban development that it is included in figure 2.2 as well.

Underscoring present uncertainties, this figure displays two population growth projections by the U.S. Census Bureau, with the 2012 estimates considerably lower than those prepared four years earlier, largely due to substantial downward revision in the outlook for immigration. Labor force growth is the weakest of the 2020 projections because of large losses resulting from retiring baby boomers, while household growth is the strongest, because baby boomers are holding on to their households, while millennials are expected to rapidly form households after previous delays.

Regardless of these long-term trends, a plethora of data are reported in annual or quarterly updates that record short-term changes. It is perhaps not surprising, given the lack of research attention to longer-term outlooks, that news about short-term trends has dominated public discussion about the recovery. The essential challenge for thinking about the future is how to balance both recent and long-term trends.

Criteria for Forming Longer-Term Outlooks As attractive as the most recent trends are as a guide to tomorrow, their short duration makes them less reliable in predicting the future than more deep-seated long-running trends or patterns of behavior. Projections that are grounded in these long-running trends may have greater inherent plausibility than other projections based only on current surveys or current preferences of analysts.

As a guide to thinking about the potential building blocks for constructing an outlook on the future of urban development, consider the distinctions among different trend indicators presented in figure 2.3.

Among the more-certain indicators are the predictable changes in population composition due to aging and other factors. Less certain is immigration, whose volume of new arrivals is subject to policy control and has exhibited great volatility over the past 20 years. Nonetheless, these factors affect the population that is eligible to shape urban development patterns.

Rates of behavior can be applied to each segment of the population. These data are more certain if they have remained consistent over the past two decades. Only a few factors have been relatively invariant over time, as shown in figure 2.3. Other factors are also relatively more predictable because they have been chang-

Figure 2.3
Relative Certainty of Trends as Indicators of Future Outcomes

More Certain	Less Certain
Predictable changes in population composition Aging baby boomers with large numbers Coming of age of the numerous millennials Decreasing predominance of white population	**Unpredictable changes in population composition** Boom, bust, and recovery of immigration
Behaviors invariant across decades Household formation between ages 40 and 55 Upward mobility of settled immigrants Upward mobility of native-born population (save 2005–2012)	**Abrupt behavior changes associated with Great Recession** *Accelerating of past trends* Applied to most of the above *Decelerating or reversing past trends* A clear break with past upward mobility into home ownership Revived growth of older cities and central neighborhoods
Behaviors trending in one direction since 1990 or earlier Delayed retirement cumulating since 1985 Declining geographic mobility at all ages since 1985 Decreasing housing affordability since 1975 Falling home ownership rates at ages 20–34 since 1980 Falling population of large older cities (save 2010–2013)	**Continuation of accelerated changes from Great Recession** Uncertain, but likely some carry over to future lifestyles
	Attitudinal changes among consumers and experts Promotion of resource-conserving lifestyles Promotion of walkable lifestyles in compact neighborhoods Supportive of many changes observed above, but uncertain if this differs from values prevalent in 2000

ing in a consistent manner since 2000 or earlier, predating both the bubble and the post-bubble crash. Some changes attributed to the Great Recession, though measured from 2006 to 2012, are actually continuations of long-standing trends. Numerous examples of consistent trends are given in figure 2.3. The slowdown in geographic mobility is a prime example.

In contrast to these invariant or longer-running trends, the short-term disruptions of the Great Recession may or may not have lasting effects. In general, as indicated in figure 2.3, it appears that the recession effects may have accentuated trends already under way prior to the recession. For example, geographic mobility slowed even more than before, retirement delays became more pronounced, and household formation and home ownership both fell among young adults more quickly than previously. Only a couple of trends reversed course during the recession. Cohorts' upward mobility into home ownership was greatly reduced

among the young and turned negative for middle-aged households. Population declines in large older cities also appear to have reversed course, with population rising from 2010 to 2013.

The lasting effects of recession-induced adjustments are uncertain, although it seems probable that the longer the millennial generation, still in its formative years, languishes in this state, the greater the likelihood is that these young cohorts will acquire lasting characteristics that will persist even after full economic recovery. Nonetheless, we concur with the recent outlook on the millennials expressed by Jason Furman, the chairman of the president's Council of Economic Advisers, which places much greater weight on the persistence of long-standing secular trends than on short-term adjustments (Furman 2014).

The Demographic Foundations of Urban America

Demographic change proceeds very gradually, one year at a time, and so it often escapes notice. Periodically, a key benchmark may be passed or a reassessment may be conducted after a census. But for the most part, the gradual change is so slow and steady as to not be worthy of reflection. Over a decade or two, however, the change can seem dramatic, even reversing what analysts took for normal before.

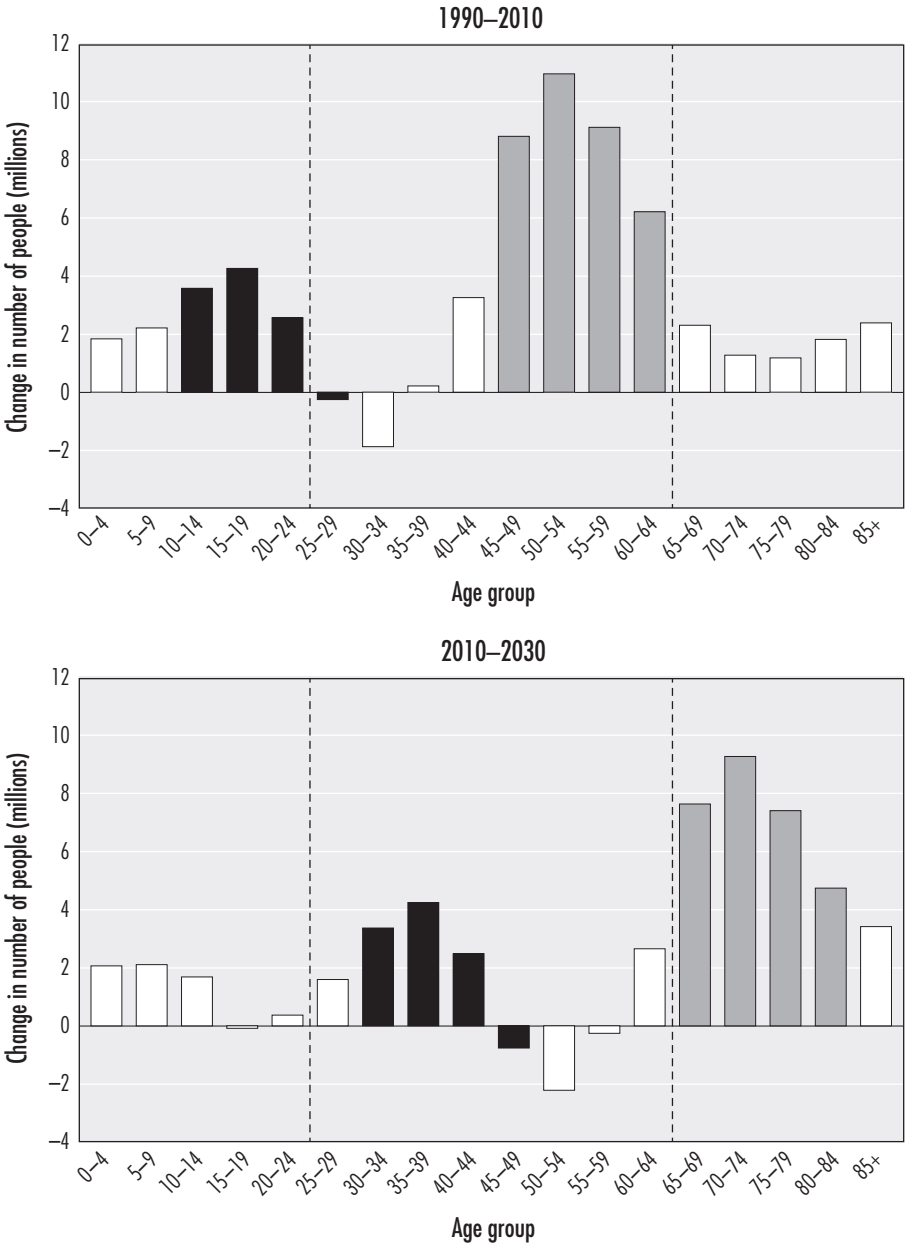
Five key factors are most significant in the changing demographics that shape urban America today: (1) the shifting size of age groups; (2) the rise and fall of immigration; (3) the role of 25-year-olds in urban turning points; (4) growing racial and ethnic diversity; and (5) the soaring senior ratio.

THE SHIFTING SIZE OF AGE GROUPS

Consider the changes by age group over the next 20 years compared with those of the past 20 years (figure 2.4). The growth or decline of age groups is important because people of different ages make very different contributions to and demands on society (Lee, Donehower, and Miller 2011). The age range from 25 to 34 is most critical for new family formation, new workforce members, and new housing demand, while that from 65 to 74 has opposite effects, such as increasing retirements and, later, household dissolutions. Figure 2.4 shows that young adults were declining in number from 1990 to 2010. Growth was concentrated in the middle ages, where people earn their maximum incomes and often buy the largest houses, with ample driveway space for teenagers. In contrast, from 2010 to 2030 growth will be resurgent among young adults, the numbers in middle age will be stagnant, and the biggest surge will be in those age 65 and up.

Growth patterns could not be more different in the two eras. Businesses and institutions that were attuned to surging demand among middle-aged population in the 1990s will face slackening demand in the 2010s. Similarly, urban areas that were moribund for lack of young people in the earlier era are now expected to experience an exciting regeneration when the larger-sized millennial generation enters.

Figure 2.4
Growth or Loss in Age Groups, 1990–2010 and 2010–2030 (in millions)



Sources: U.S. Census Bureau (2012a); data from 1990 and 2010 Census Summary File-1; U.S. Census Bureau.

These changes will be so dramatic because of the size differences between the baby boom generation (born from 1946 to 1964) and the cohorts that both preceded it and immediately followed it (the "baby bust" generation, also known as Generation X). The millennials (also termed Generation Y, born from 1980 to 2000, roughly) are an echo of the baby boomers because they are mostly the children of boomers. Even though this group is numerically somewhat larger than the baby boomers, the millennials do not stand out in size as much from the preceding and following cohorts as did the boomers. Nonetheless, their entry into adulthood has injected fresh vitality where previously there was only decline.

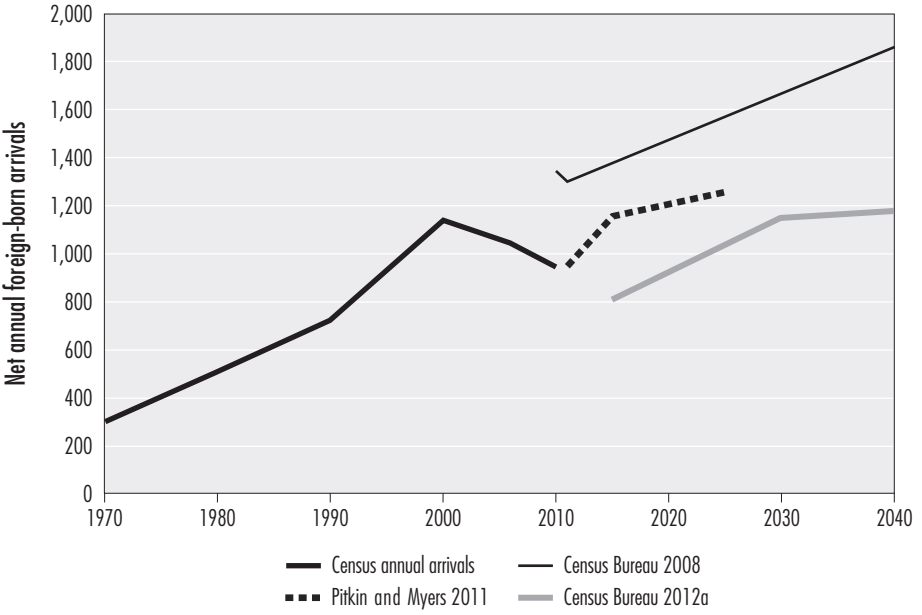
Two major age changes over time deserve the closest attention, one being the impacts of growing numbers of adults in their 20s, and the other being the unprecedented rise in a senior population. Before examining those changes, the important role of immigration should be considered.

THE RISE AND FALL OF IMMIGRATION

In contrast to the stability of age changes, among the most volatile demographic changes is immigration, mainly because it is subject to uncertain policy changes, but also because immigration tends to respond to growth in labor demand, which varies over the economic business cycle. A sizable amount of immigration each year is not authorized by official policy and is undocumented, making its analysis even more elusive. Nonetheless, the decennial census and other periodic surveys by the U.S. Census Bureau attempt to sample all the foreign-born people living in the United States, regardless of visa status. Figure 2.5 reports estimated annual arrivals based on responses to census takers' question of when each immigrant came to the United States to stay. The figure also compares three alternative projections of new arrivals after 2010, all of which assume a rising trend.

The rise of immigration after 1970 was dramatic, with annual flows in the 1990s expanding by 258 percent compared with those observed immediately before the 1970 census. The upsurge in new arrivals peaked around 2000 and began a moderate decline thereafter. After the collapse of construction employment in 2007 and the ensuing rising unemployment, immigrant arrivals dropped even further. Three projections of immigrant arrivals are compared in figure 2.5. In 2008, the Census Bureau released population projections that appear to have assumed the number of annual arrivals would extend the trend observed from 1970 to 2000 (U.S. Census Bureau 2008). In 2011, Pitkin and Myers (2011) issued new projections that included input on future immigration flows from a Delphi-like panel of experts. These new estimates were lower than the lowest alternative presented by the Census Bureau in a 2009 supplement (U.S. Census Bureau 2009). In 2012, the Census Bureau issued new projections based on new immigration assumptions, which were much lower than their earlier projections (U.S. Census Bureau 2012a). The highest alternative was now lower than the projection by Pitkin and Myers (2011). Nonetheless, the revised projections anticipated a resumption of increasing levels of new arrivals each year, as shown in figure 2.5.

Figure 2.5
Estimated Annual Immigrant Arrivals in the United States, 1980–2040 (in thousands)



Note: Census annual immigrant arrivals (legal and illegal combined) are calculated as the average of the five-year interval prior to the survey year; Census Bureau future immigrants expected in the 2008 and 2012 vintage projections are from the middle series; Pitkin and Myers future immigrants are derived from an opinion survey of experts' expectations for 2015 and 2025.
Sources: U.S. Census Bureau (2008, 2012a); Decennial Census Data of 1970, 1980, 1990, and 2000; 2006 and 2010 American Community Survey, U.S. Census Bureau; Pitkin and Myers (2011).

The volatile history of immigration and its uncertain outlook has direct impacts on housing and cities. Harvard University's Joint Center for Housing Studies (2012) has estimated that immigration in the 1990s and early 2000s accounted for one-third of the net household formations in the nation. Because new immigrants have a household formation rate of roughly 40 percent, a downturn of half a million arrivals per year would equate to a loss of 200,000 new household formations per year. The effect on home ownership would also be substantial, even if it was delayed a decade or two after immigrant arrival. The immigrant share of new homeowners has increased steadily over recent decades, rising from 10 percent of homeowner growth in the 1980s to 20 percent in the 1990s and 38 percent in the 2000s, and it is projected to remain at roughly that share (36 percent) in the 2010s (Myers and Liu 2005; Myers and Pitkin 2013).

Immigrant growth in housing demand has plugged important gaps in the housing market, first adding renters in the 1990s, when native-born growth in rental demand was depressed for age structure reasons, and then adding homeowners in the 2000s, when native-born growth in owner demand also was

depressed (Myers and Pitkin 2013). Without the infusion of immigrant demand, the nation's housing market history, and the economic health of immigrant gateway urban areas, would have been much worse. With fewer immigrant arrivals in the current forecasts, a weakened housing market will need to rely even more heavily on native-born Americans, especially young adults, to stimulate a revival.

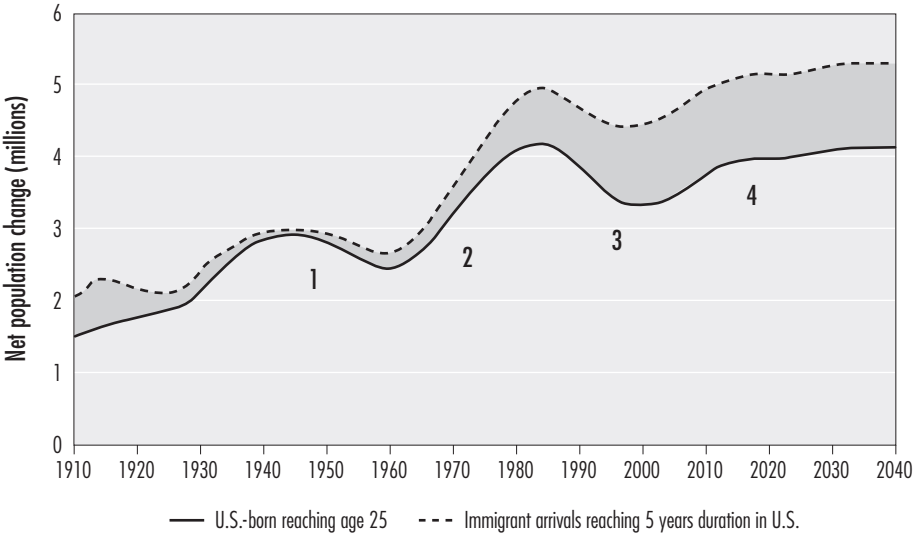
THE ROLE OF 25-YEAR-OLDS IN URBAN TURNING POINTS

The importance of young adults cannot be overstated in regard to the housing market. Even if the bulk of U.S. households are over age 45, the market requires an infusion of new demand to offset the inevitable losses at older ages (Masnick 2014). The demographic view of housing and cities stresses the entry of young adults in their twenties, whose household formation and upward strivings create a strong platform of demand to fill housing vacancies and support new construction. In times when the number of young entrants is subdued, markets soften and lose the growth needed to support investment in both the existing stock of housing and new construction.

Myers and Pitkin (2009) reached this conclusion in their study of demographic forces and turning points in U.S. cities. They identified several turning points beginning in the early postwar period: (1) the spreading gray areas of bleak, run-down conditions in northeastern cities and the rise of housing abandonment; (2) the resurgence of cities in the 1970s with the massive entry of baby boomers, which spawned the first gentrification and launched the housing affordability crisis; (3) the collapse of apartment construction in the 1990s and the hollowing out of cities, while urban sprawl swept the outer suburbs; and (4) the beginning of urban revival after 2000, when apartment construction resumed and a new back-to-the-city movement was first detected. Many different explanations have been posited for these changes, including Federal Housing Administration (FHA) policies, the growth of suburban freeways, federal tax law changes in 1986, crime, and urban politics. All of these factors certainly played a role. But underneath the turning points lay a single demographic shift: either a decline or a strong upward rebound in the number of people turning 25. Added to these native-born Americans was the number of recently arrived immigrants. As figure 2.6 shows, the trend in this summary demographic indicator of new entry-level demand has varied dramatically from decade to decade, and its ups and downs have marked dramatic shifts in demand that have spurred important turning points.

Given this perspective, the recent revival of apartment construction and inner-city living could have been predicted long before the Great Recession. How long it will continue after recovery from the recession is not certain, but the downturn in immigration and the consequent reduction in annual household formations will weigh heavily in this trend when the last of the millennial generation passes age 25.

Figure 2.6
Four Turning Points Marked by the Rise and Fall in the Number of Adults Turning 25 and Recent Immigration (in millions), 1910–2040



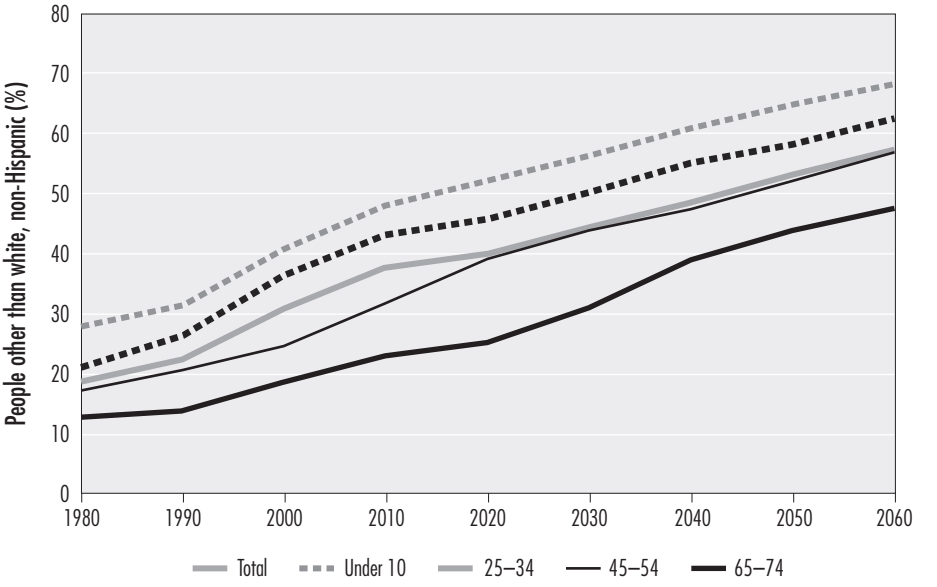
Source: Derived from Myers and Pitkin (2009).

GROWING RACIAL AND ETHNIC DIVERSITY

This aspect of demographic change has commanded a large amount of attention. The rise of immigration has stimulated a racial and ethnic transition in the United States that is making the population increasingly diverse. Birthrates have been low for decades, and thus immigration has a larger proportional impact on the country's overall racial and ethnic makeup. In addition, the Hispanic population has a higher birthrate than other population groups—not the large difference sometimes imagined, or that may have existed in the past, but on the order of half an additional child per woman, resulting in a total fertility rate of 2.4 children per woman, compared with 1.8 for whites, 2.0 for blacks, and 1.7 for Asians (Mather 2012). Overall, the nation's fertility rate is only 1.9, which is substantially lower than the replacement level of 2.1.

As a result of these dynamics, diversity is growing rapidly among children and young adults. Over time, this diversity will spread to older adults, as illustrated in figure 2.7, which shows how much more diverse children under age 10 are (and will continue to be) than the rest of the population. For our purposes, more relevant is the growing diversity of young adults, who represent new entrants into housing markets and new workers and taxpayers living in cities. In 1990, 26.3 percent of 25- to 34-year-olds belonged to racial or ethnic minorities

Figure 2.7
Rising Racial and Ethnic Diversity by Age Group, 1980–2060



Sources: U.S. Census Bureau (2012a); 1980 and 1990 5 Percent Public Use Microdata Sample, U.S. Census Bureau; 2000 and 2010 Census Summary File-1, U.S. Census Bureau.

other than white, non-Hispanic. By 2010, that share had risen to 42.2 percent, and it is anticipated to reach 45.7 percent by 2020. By 2030, the share of minorities, comprising all people of color, will grow to be the majority (50.2 percent) of 25- to 34-year-olds. At that time, 56.2 percent of children under age 10 will be people of color, as will 30.8 percent of young seniors (ages 65–74).

THE SOARING SENIOR RATIO

As significant as the growing diversity of the American population may be, the dramatic age shifts in the population will have much greater economic and fiscal consequences. When all of the baby boomers have advanced past age 65, which will be largely accomplished by 2030, the nation will experience an unprecedented top-heavy age structure. This is a challenge confronting countries across the developed world, especially those in Europe and East Asia. The demographic problem that poses is that nations will face the prospect of having a large older population, which was a product of a high fertility rate in the past, followed by a relatively smaller working-age population, which was born when the fertility rate was much lower. The economic problem is that older residents will be entitled to old-age supports that must be paid for by an undersized working-age population. This imbalance will extend to the housing market as well (Myers and Ryu 2008). Older residents will still sell their homes to younger residents, but the ratio of

older sellers to younger buyers will not be as favorable for sellers as it once was. The political challenge for policy making is that this top-heaviness has never occurred before and is creeping up on policy makers slowly, so it is difficult to focus attention and gain consensus about how to plan for this situation in advance.

Consider the rapidity of the change. The senior ratio of the population age 65 and older per 100 working-age residents has remained virtually constant since 1970 at roughly 24 per 100. Anything that stays this constant for 40 years becomes invisible and taken for granted. Suddenly, however, since 2010 (24.6 per 100) the ratio has begun to rise sharply, and by 2030 it is projected to reach 41.7 per 100, an approximately 70 percent increase in the senior ratio.[5] Everything that was previously in balance between older and working-age residents is now about to be thrown out of balance. The issue most germane to the present study is the coming shortfall of adequate numbers of home buyers to absorb the senior sell-off expected after 2020 (Myers and Ryu 2008; Nelson 2012; Pendall et al. 2012).

An interesting feature of the rising senior ratio is how widely it is spread across the United States (figure 2.8).[6] Among the policy solutions proposed by Myers and Ryu (2008), the most constructive is to cultivate the economic capacity of the diverse younger generation so that each young adult will be more productive and will be better able to support the heavier senior load. In practical terms, that implies much greater equality of access to higher education, development of job opportunities, and help for young people to become home buyers. As figure 2.8 makes clear, this would have to be a nationwide agenda, because the senior ratio is rising dramatically in all the states.

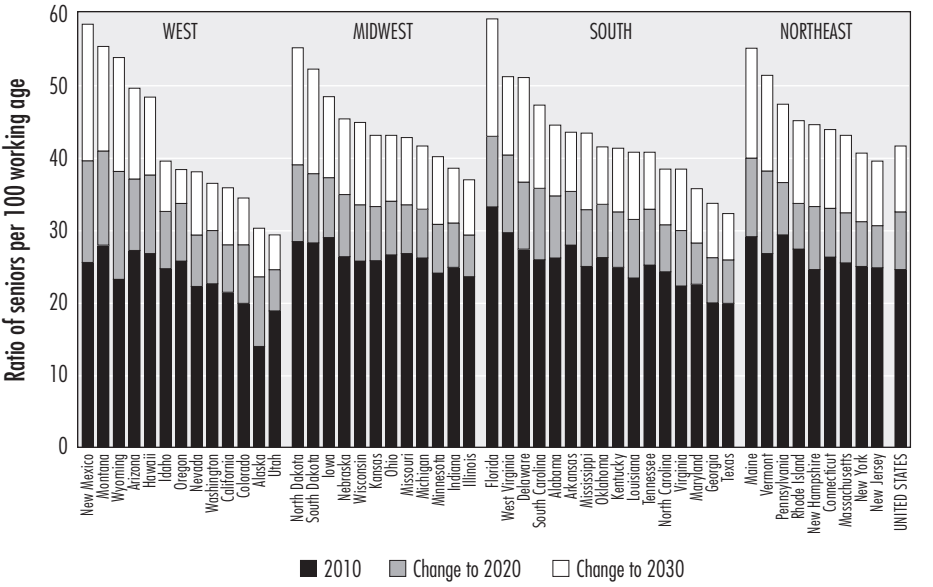
Population Shifts Within Metropolitan Areas

The preceding discussion deals with demographic changes largely at the national level. Certainly, some of these changes appear to be taking place nationwide and can be expected to occur in all urban areas. But a number of questions have emerged in debates over the changing nature of cities themselves. Are people today more likely to choose to live in large metropolitan areas than they were a decade or two ago? Are more people, particularly young adults, choosing to live downtown in large metropolitan areas? Are people "abandoning" the sub-

5. Historical data are from the traditional decennial census, and projections post-2010 are from the U.S. Census Bureau (2012a). Working age is defined for this purpose as ages 25–64. Young people ages 16–24 may be able to work, but in the modern economy they are more often in school or training as interns and apprentices. The traditional alternative to what we term the *senior ratio* is the *old-age dependency ratio*, a term that does not resonate well with older voters who live independently, even if they enjoy taxpayer assistance.

6. We constructed the data based on the most recent series of population projections by age prepared for the 50 states by the U.S. Census Bureau (2005b), adjusting for changes recorded in the 2010 census.

Figure 2.8
Senior Ratio Increase by State, 2010–2030



Note: Senior ratio is defined as population 65 and older per 100 working-age population (25 to 64). Each bar represents the senior ratio recorded in a given state in 2010, followed by the increment of increase projected between 2010 and 2020 and between 2020 and 2030. In the United States, as an example, the ratio was 24.6 seniors in 2010 per 100 working-age population. The ratio is projected to rise to 31.9 in 2020 and 41.1 in 2030.
Source: Data from U.S. Census Bureau (2005b), adjusted for 2010 census.

urbs for more-urban living? Is this back-to-the-city movement common in most large metropolitan areas? Or is it more common, say, in the Northeast than in the South and West? And what of seniors—how are their locational preferences changing in ways that are similar to or different from those of young adults?[7]

These are questions we have sought to answer by undertaking a carefully structured examination of distributional shifts in the U.S. population either into or out of the centers of the 50 metropolitan areas with a population of one million or more. We believe that these areas represent well the nature of all large metros in the United States, as fully 70.9 percent of U.S. residents live within 75 miles of their centers. It bears mentioning that the outer rings of the metros often take in satellite cities whose concentration of employment and housing results in large spikes in population. Interspersed are fairly rural exurban dis-

7. Space limitations prevent us from exploring other important questions, including the growing presence of immigrants, diversity and segregation, and matters of poverty and wealth.

tricts, which are folded into the same or adjoining distance bands, thus creating volatility in the outer rings. That is of little practical interest to us, however, and instead we focus on an inner core of less than 5 or 10 miles and suburban bands of 15–40 miles.

ANALYSIS OF INTERNAL POPULATION CHANGES

A central premise of the back-to-the-city thesis is that young people in particular are flocking to close-in neighborhoods in central cities and forsaking the outer locations where they once were prominent (Florida 2013, 2014; Frey 2014). There are many well-known neighborhoods where this has occurred and many cities where there is evidence of growing numbers of young people downtown (Birch 2012; Defterios 2014; Piepenburg 2014). At the same time, young adults might be responsible for growth in many parts of the same city, and it is possible that only a select number of metropolitan areas are engaged in substantial growth downtown.

We selected for analysis all 50 metropolitan regions in the United States with a population of at least one million (figure 2.9). Using geographic information system (GIS) techniques, census tracts are classified by distance from the center of a metro, specified here as the location of the city hall in the primary city in the metro.[8] We next created distance bands by aggregating all the census tracts into successive 2.5-mile rings out to 10 miles, and into 5-mile rings out to a maximum of 75 miles. In cases where the outer orbit of one metro infringed on that of another, we assigned tracts to the metro whose city hall was closest. This method provides a means of standard comparison that is not possible when using central cities and suburbs, because of their changing boundaries over time and uneven sizes that make different central cities smaller or larger proportions of their respective metropolitan area.

POPULATION TRENDS IN CITY CENTERS

To address whether population growth is shifting toward the inner city, we compared growth from 2000 to 2010 with that from 1990 to 2000. The results for population growth in all large metros combined are shown in figure 2.10. The top panel presents growth trends for total population, the middle panel for adults ages 20–34 (the millennials), and the bottom panel for seniors age 65 and older.

In the case of total population, very little growth was registered at the center of the nation's large cities in either decade. On average, the fastest rates of growth occurred between 15 and 30 miles from the city center, clearly suburban locations. The results were very different for young adults, however. In the 1990s,

8. We are indebted to the Census Bureau's special report "Patterns of Metropolitan and Micropolitan Population Change: 2000 to 2010" (U.S. Census Bureau 2012b) for the method used in this chapter. The primary city in the metro and its location are based on the Census Bureau's data, available at *www.census.gov/population/metro/data/pop_data.html*.

Figure 2.9
Top 50 Metropolitan Statistical Areas

Northeast □
New York–Northern New Jersey–Long Island, NY-NJ-PA Metro Area
Philadelphia–Camden–Wilmington, PA-NJ-DE-MD Metro Area
Boston–Cambridge–Quincy, MA-NH Metro Area
Pittsburgh, PA Metro Area
Providence–New Bedford–Fall River, RI-MA Metro Area
Hartford–West Hartford–East Hartford, CT Metro Area
Buffalo–Niagara Falls, NY Metro Area
Rochester, NY Metro Area

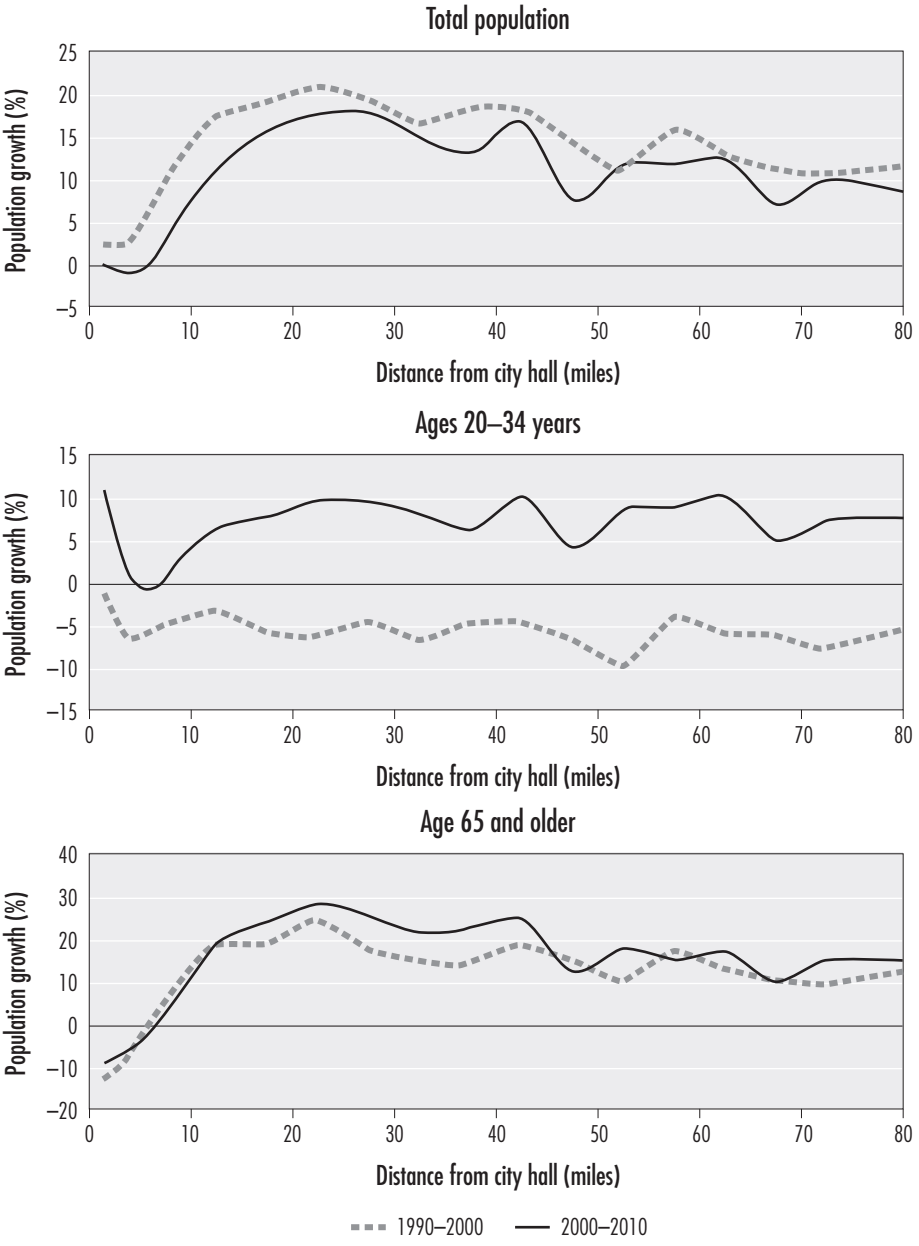
Midwest ■
Chicago–Joliet–Naperville, IL-IN-WI Metro Area
Detroit–Warren–Livonia, MI Metro Area
Minneapolis–St. Paul–Bloomington, MN-WI Metro Area
St. Louis, MO-IL Metro Area
Cincinnati–Middletown, OH-KY-IN Metro Area
Cleveland–Elyria–Mentor, OH Metro Area
Kansas City, MO-KS Metro Area
Columbus, OH Metro Area
Indianapolis–Carmel, IN Metro Area
Milwaukee–Waukesha–West Allis, WI Metro Area

South ■
Dallas–Fort Worth–Arlington, TX Metro Area
Houston–Sugar Land–Baytown, TX Metro Area
Washington–Arlington–Alexandria, DC-VA-MD-WV Metro Area
Miami–Fort Lauderdale–Pompano Beach, FL Metro Area
Atlanta–Sandy Springs–Marietta, GA Metro Area
Tampa–St. Petersburg–Clearwater, FL Metro Area
Baltimore–Towson, MD Metro Area
San Antonio–New Braunfels, TX Metro Area
Orlando–Kissimmee–Sanford, FL Metro Area
Charlotte–Gastonia–Rock Hill, NC-SC Metro Area
Austin–Round Rock–San Marcos, TX Metro Area
Virginia Beach–Norfolk–Newport News, VA-NC Metro Area
Nashville–Davidson–Murfreesboro–Franklin, TN Metro Area
Jacksonville, FL Metro Area
Memphis, TN-MS-AR Metro Area
Louisville/Jefferson County, KY-IN Metro Area
Richmond, VA Metro Area
Oklahoma City, OK Metro Area
New Orleans–Metairie–Kenner, LA Metro Area
Raleigh–Cary, NC Metro Area
Birmingham–Hoover, AL Metro Area

West ■
Los Angeles–Long Beach–Santa Ana, CA Metro Area
San Francisco–Oakland–Fremont, CA Metro Area
Phoenix–Mesa–Glendale, AZ Metro Area
Seattle–Tacoma–Bellevue, WA Metro Area
San Diego–Carlsbad–San Marcos, CA Metro Area
Denver–Aurora–Broomfield, CO Metro Area
Portland–Vancouver–Hillsboro, OR-WA Metro Area
Sacramento–Arden–Arcade–Roseville, CA Metro Area
Las Vegas–Paradise, NV Metro Area
San Jose–Sunnyvale–Santa Clara, CA Metro Area
Salt Lake City, UT Metro Area

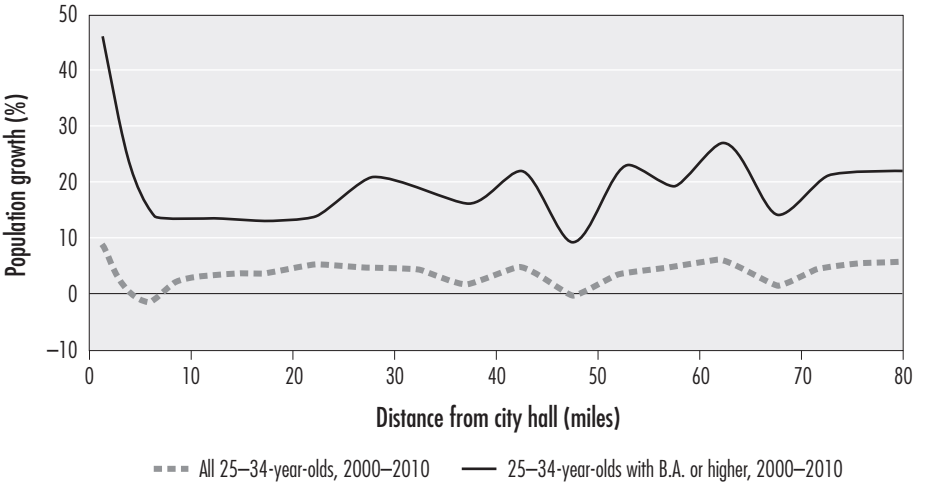
Note: The 50 Metropolitan Statistical Areas are selected to include those with the largest populations in 2010.
Source: Base map is from Environmental Scientific Research Institute, © ESRI, with metropolitan area overlay by the authors.

Figure 2.10
Population Growth in the Top 50 Metros by Distance from City Hall, 1990–2000 and 2000–2010



Sources: Data from 1990, 2000, and 2010 Census Summary File-1, U.S. Census Bureau.

Figure 2.11
Population Growth in the Top 50 Metros for College-Educated Compared to All Young Adults by Distance from City Hall, 2000–2010



Sources: Data from 2000 and 2010 Census Summary File-1, 2000 Census Summary File-3, and 2012 American Community Survey 5-year estimates, U.S. Census Bureau.

growth in this age group was negative at every distance, averaging around –5 percent, as the last of the baby boomers exited and the baby busters entered the young adult age group. Conversely, in the 2000s growth among young adults was resurgent nationwide as the millennials entered young adulthood and showed up at virtually every distance from the city center. The innermost band registered 10 percent growth in young people; the one "dead zone," where zero growth was observed, was between 5 and 10 miles from the center. In contrast, growth among seniors was negative in both decades in a zone of less than 7.5 miles from the center. Strong growth of more than 20 percent was registered in a broad belt measuring 10–40 miles out. These results are mainly consistent with those from county-based data analyses (Kotkin 2014; U.S. Census Bureau 2005a).

Reports of gentrification often mention college education as a key indicator (McKinnish, Walsh, and White 2010). We repeated the analysis of 2000–2010 for young adults ages 25–34 with a bachelor's degree or higher (figure 2.11). Shown for comparison is the growth for all young people in that age group regardless of education. The difference amounts to about 5 percent in all bands at any distance from the city center. The one exception is a small uptick of 10 percent among all young people in the immediate center, in contrast to 47 percent among young people with a B.A.—more than four times greater. Growth for those with a B.A. was 15–20 percent at most distances—three times greater than

for all young people. When compared for metro areas located in the four regions of the United States (data not shown), very similar growth in the city center was found in the Northeast, Midwest, and South. Growth for college-educated young people was weakest by far in the West and strongest in the Northeast.

NET SHIFTS FROM SUBURBS TO CITY CENTERS?

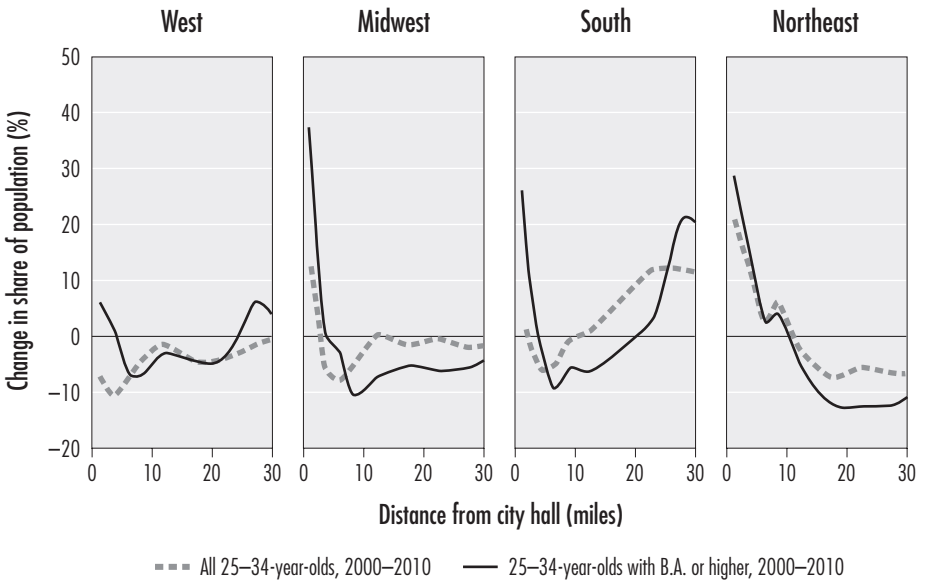
The preceding figures are informative, but the findings do not fully address the narrative of population shift back to the city. Our analysis above does not measure the net shift between locations. In some cases, there has been growth in all zones, and in others there has been loss in all zones. To find out whether the inner city is gaining at the expense of the suburbs, we calculated changes in each distance band's *share* of a given population group in the region. If one band is capturing a larger share, others must capture a smaller share. This analysis provides a picture of shifting relative preferences for inner or outer locations.

In general, the changes in the shares of total population, young adults, and seniors closely resemble those reported in the previous section. However, when we examined the growth in the locational shares of college-educated young people during the 2000s, we found a much stronger shift toward the city center in the nation as a whole. The shares increased by 23 percent in the innermost band and decreased by 5 percent at a distance of 7 to 25 miles. These locational shifts were far more pronounced among college-educated young people than among the total population ages 25–34.

Distinctly different patterns of population shifts occurred among the college educated in different census regions (figure 2.12). All regions except the West showed evidence of locational shifts downtown. In the Northeast, the shift was strongest within 10 miles of the city center, and it was accompanied by decreased shares (by roughly 10 percent) of those residing 12–50 miles from the center. In the midwestern metros, the downtown shift was confined to the innermost band, and the decrease in shares through the suburban zone was only half as great. In the southern metros, the average pattern was even more distinctive: an increase in shares of college-educated young people in the innermost band, a decrease from 7 to 15 miles out, and then a large (20 percent) increase from 25 to 35 miles. These outer zones are likely an indication of satellite cities or edge city concentrations of shopping, entertainment, and office buildings, which attract the college educated (Lang 2003). Less pronounced concentrations of growing shares like this are observable in figure 2.12 at 30–40 miles in the West and at 40–50 miles in the Northeast and Midwest.

Overall, this analysis of shifting population shares found partial evidence of a return to the city center in large metro areas. The most dramatic changes were not for total population but for young adults, and those changes were concentrated in the inner 5 miles of the metro. At the same time, those changes, strongest in the Northeast and Midwest, were driven particularly by the young college-educated population.

Figure 2.12
Change in Share of College-Educated Young Adults by Distance from City Hall, Top 50 Metros by Census Region, 2000–2010



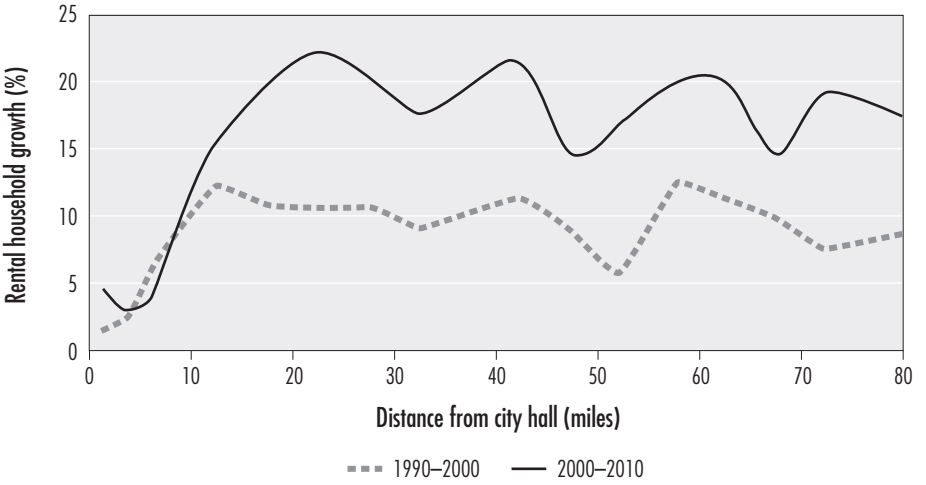
Note: The change in share of population refers to the proportional change of the share of metropolitan population that is within a given distance band.
Sources: Data from 2000 and 2010 Census Summary File-1, 2000 Census Summary File-3, and 2012 American Community Survey 5-year estimates, U.S. Census Bureau.

GROWTH IN HOUSING OR JUST PEOPLE TRADING HOUSING UNITS?

Do these locational shifts reflect occupancy change within the existing housing stock—a changing of the guard from one group to the next—or are they associated with the growth of new housing units downtown or in the suburbs? This section tracks the changing growth patterns of rental and owner-occupied housing.

Location of Resurgent Rental Housing As discussed earlier, one of the turning points spurred by demographic change was the post-2000 revival of growth among young adults and the consequent new demand for increased rental housing. One question that can be answered through our distance-band analysis is whether this resurgence led to new construction of rental housing primarily only in inner cities or throughout the suburbs as well (figure 2.13). In large metros nationwide, there has been a broadly distributed revival of rental housing, which has nearly doubled in most distance bands from around 10 percent growth during the 1990s to 15–20 percent growth in the 2000s. Downtown construction may be highly visible, but rental growth in the innermost band (less than 2.5 miles)

Figure 2.13
Growth in Rental Households in the Top 50 Metros by Distance from City Hall, 1990–2000 and 2000–2010



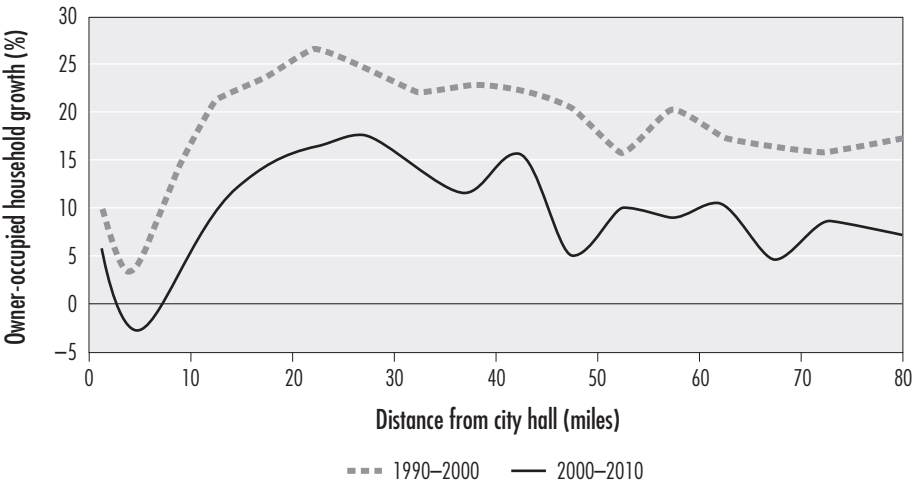
Sources: Data from 1990, 2000, and 2010 Census Summary File-1, U.S. Census Bureau.

rose only from 1.6 percent to 4.7 percent, while in the next bands there was no change in growth until passing more than 10 miles from the city center, where large increases began to occur. This might imply that the growth in the young adult population, especially those who are well educated, has not caused substantial construction of rental apartments.

Sizable differences in rental growth occurred in the four census regions (data not shown). The Northeast experienced 6.6 percent growth downtown, which was greater than the growth in all but two other bands located within 40 miles of the city center. In contrast, the 2.7 percent growth downtown in the Midwest was surpassed by the growth at all distances of more than 7 miles from the city center. In the South, the meager 1.6 percent rental growth downtown was overshadowed by 25 percent or greater growth in bands between 15 and 40 miles from the city center. And in the West, the 7.1 percent rental growth downtown was overshadowed by 20 percent or higher growth in bands extending more than 10 miles from the center. In summary, except in metros in the Northeast, the resurgence of rental housing has been much more substantial in the suburbs than in the inner city.

Location of Owner-Occupied Housing Perhaps new construction downtown has been for sale and not for rent. Could all those college-educated young people be living in new condos? According to our analysis, the growth of owner-occupied housing nationwide was much reduced in the 2000s from what it was in the 1990s, with a similar decline in every distance band throughout the metros

Figure 2.14
Growth in Owner-Occupied Households in the Top 50 Metros by Distance from City Hall, 1990–2000 and 2000–2010



Sources: Data from 1990, 2000, and 2010 Census Summary File-1, U.S. Census Bureau.

(figure 2.14). Moreover, the growth in owner-occupied housing basically occurred in the same bands as that in rental housing and was highest for bands from 15 to 30 miles from the city center. Much slower growth occurred downtown in the 2000s (5.8 percent), and that growth was even slower than in the 1990s.

Again, there were regional differences (data not shown). In the Northeast, a much higher rate of homeowner growth was recorded downtown in the 2000s (7.0 percent) than in the 1990s, and a higher rate was found downtown than in any band closer than 35 miles from the city center. In the Midwest, growth of owner-occupied housing downtown was 11.6 percent in the 2000s, less than in the 1990s, but it matched the growth in any suburban band less than 40 miles from the center. In the South, homeowner growth downtown was minuscule (1.3 percent), while in suburban bands 15 to 30 miles from the center, it approached 30 percent. And in the West, a growth rate of 7.7 percent downtown was surpassed by the 15 percent growth rate common in bands more than 10 miles from the center.

The overall conclusion from this housing analysis is that the growth in rental and owner-occupied housing was consistent with population movements downtown, but this growth was generally much less than would seem adequate to accom-

modate the population shifts. Given that overall population growth downtown was slight and only young adults seem to be flocking there, the likely scenario is that the young are replacing other residents who are moving out of the city center. This youthful replacement is readily accommodated by rental housing that turns over every two or three years on average. Even among homeowners, 30 percent or more of older homeowners surrender their occupancy within 10 years, a turnover rate that is slightly greater in the innermost bands than in the rest of the metro (data not shown).

SUMMARY OF LOCATIONAL PREFERENCES: BACK TO THE CITY?

The many findings produced in this intrametropolitan analysis are consistent with a weak trend of population movement back into the city. The strongest growth overall is in a broad suburban band located 20 to 30 miles from the city center, sometimes farther. There is clear evidence, however, of a revival concentrated within 5 miles of city hall. College-educated young adults are burgeoning in number and shifting toward downtown locations, but there is little else to support a claim of a back-to-the-city trend, as growth of rental and owner-occupied housing has not shifted substantially inward. Instead, well-educated young people are largely replacing older residents, as well as more-moderate-income residents, in existing housing units. These occupancy changes might be locally intense when they are focused on particular areas of gentrification.

Projecting the Future Trend of Home Ownership

Trends in renting and owning loom large in thinking about people's residential choices in cities. One of the major impacts of the Great Recession has been the disruption of housing markets, resulting in the loss of billions of dollars in family wealth and traumatizing the younger generation with fears about the dangers of home ownership. Even though the risk of such a downturn occurring nationwide is very low—the last one having taken place during the Great Depression—the recent recession is fresh in people's minds, and so the probability that another will occur feels high. Meanwhile, cities have been the beneficiaries of rising populations, as outflows have slowed while inflows have continued. Legions of young millennials have continued to enter adulthood and set up urban households in shared rental housing.

Plans for the future metropolis depend in good measure on expectations about future trends in renting and owning. Will millennials continue to reside in rental housing as they grow older, carrying this urban lifestyle with them into middle age, or will they revert to the housing choices of their predecessors, seeking out single-family housing for purchase wherever it is affordable, where amenities are attractive, and/or where schools are good?

The public still widely prefers home ownership, even after severe losses in the financial crisis and resulting skepticism by some millennial thought leaders

(Rampell 2014). Owning your own home has long-standing favored treatment in the tax code and is generally seen as both a merit good and civically desirable (DiPasquale and Glaeser 1999; Green and White 1997; Rohe, Van Zandt, and McCarthy 2002). In addition, housing is a major sector of the economy, with home buying and new construction major contributors, for both the employment these activities support and the investment they spur. Construction typically expands early in the recovery phase after a recession and helps boost the recovery, with construction of each single-family home (typically owned) contributing two and a half times more to GDP than each apartment unit (Furman 2014). In addition, home ownership is the major means of building wealth for citizens outside the top 20 percent of the income distribution. All in all, although home ownership is not for everyone and not preferable at all stages of life, it has great value for society as a whole. It also deserves note that a steady supply of younger home buyers is vital to the 54.3 million homeowners who are aging baby boomers or an older generation, without which older homeowners cannot liquidate their retirement assets.

For decades beginning in 1960, home ownership remained steady, with about 62–64 percent of households in owner-occupied homes. Between 1995 and 2000, however, the rate rose two percentage points, followed by further gains that peaked at 69.2 percent in 2004, during the housing bubble. It has since declined each year, reaching 63.9 percent by the end of 2014. A widespread topic of speculation is how low the rate of home ownership will go. The sharp swing from housing bubble to housing collapse (in 2007), followed by an unexpectedly slow recovery, makes it very difficult for professional forecasters to predict future trends with any certainty. Only a few detailed housing projections have been publicly issued since the end of the recession and the release of the 2010 census. Neither the Joint Center for Housing Studies' report in the spring of 2014 (McCue 2014) nor a study by Myers and Pitkin (2013) for the Research Institute for Housing America, a research affiliate of the Mortgage Bankers Association, was effective in addressing the recovery from the deep housing slowdown. Both studies projected out a decade or two and predicted a continuation of past trends, absent much effect of the recession. This disregard for recession effects is due to both the absence of data and limitations of methodology.

The question is, what will be the new normal for home ownership? Will it entail a steady decline, and if so, how low can the rate of ownership go? What is the prospect for resuming a steady level of home ownership, much as before? There is no single answer to these questions, because there are many uncertainties, not the least of which are policy changes being debated in Washington. Our approach to addressing these questions has been to construct alternative projections that reflect a range of recent and past experiences. In this we have been guided by the demographic perspective that treats home ownership as part of a housing career cumulating over time. Generational momentum embeds past advantages and disadvantages in a path dependence that can be usefully exploited for constructing projections.

UNDUE OPTIMISM ABOUT FUTURE HOME OWNERSHIP?

The current consensus among housing experts is an optimistic assessment of the market that appears to be based largely on the fact that the home ownership rate has fallen to the long-run average prevailing before 1995. Yet there is no guarantee that the rate will not continue to fall. Even though we also are inclined toward this optimistic view, it is apparent that it could be subverted by strong countervailing forces. Only if policy makers recognize the risks inherent in these forces and take action to mitigate their impact will the more favorable outcome be realized.

Four powerful forces could undermine the optimistic outlook on home ownership and deserve consideration: (1) sustained generational damage due to setbacks resulting from the Great Recession; (2) changed social values, priorities, and lifestyles; (3) demographic changes; and (4) policy changes that aggravate rather than mitigate weaknesses in the housing market.

First, the tremendous economic and social disruptions borne by young adults as a result of the recession and the slow recovery present the likelihood of sustained setback to their employment and housing careers (Kahn 2010). These early handicaps could transform into lingering generational damage that persists over time, leaving young adults' chances of attaining home ownership permanently reduced. Already they have fallen behind the career trajectories of preceding generations, making it unlikely that they will ever catch up (Emmons and Noeth 2014; Settersten and Ray 2010).

Second, these material disadvantages could lead to profound psychic adjustments. Young adults may be so disillusioned about the merits or safety of home ownership that their tastes and aspirations will permanently shift. (The actual survey evidence on lost preferences is more encouraging, as addressed later in this chapter.) The combined effect of weakened economic capacity and diminished desire could undermine the growing base of housing demand, which in the long run rests on the strength of incoming cohorts of new households and first-time buyers.

Third, demographic change with respect to ethnic diversity and aging could depress home ownership. Even though the millennial generation is larger than its immediate predecessors, a greater share of young people are members of minority groups, who on average have lower home ownership attainment due to fewer family resources and lower education and income levels. Under the best economic conditions, growing diversity by itself might be expected to lead to slightly lower home ownership rates. Now the diversity effect is being amplified because Hispanics and African Americans sustained greater loss of both income and wealth during the recession than did white, non-Hispanics.[9] Meanwhile, ag-

9. Between 2000 and 2012, among households ages 25–34, whites suffered a decline in real median household income of 7.0 percent, while Hispanics' income dropped 13.4 percent and African Americans' income decreased 19.9 percent (based on our tabulations from the 2000

ing baby boomers hold a very large share of all owner-occupied housing in the nation. Together with slightly older cohorts, they have the highest home ownership rates, which help to support a high national average. However, they are due to sell off many of their substantial assets in the next two decades. This sell-off will be much larger than usual because the baby boomers are so numerous and are placing the principal reliance for absorption on a more diverse younger generation (Myers and Ryu 2008). These two demographic changes—aging baby boomers and growing diversity—will create extremely different challenges from those of the past status quo.

Finally, recent policy changes by oversight institutions seeking to protect home ownership by making access more restrictive could upset the optimistic outlook. Young consumers are trapped in a "credit box" from which only the most elite are able to escape (Parrott and Zandi 2013). The paradox is that while incomes, wealth, and credit scores have all fallen among the younger and middle generations, the unhelpful countertrend has been to raise mortgage qualifying criteria ever higher, making home ownership even less accessible. Whether regulators and industry leaders have overly restricted access to mortgages could be debated. However, examination of the Mortgage Credit Availability Index created by the Mortgage Bankers Association shows that credit access has been reduced to less than one-third of what it was in 2000 or 2002, two well-functioning years before the bubble.[10] Research by economist Neil Bhutta estimates that "higher credit score thresholds used by lenders in the aftermath of the Great Recession can explain about 40 percent of the drop in first-time home buying in recent years relative to the early 2000s" (cited in Furman 2014, 10). The policy paradox is that the finance industry has been restricting access to home ownership out of fear resulting from the housing bubble while ignoring that legions of new housing consumers must be enabled if the housing sector is to be brought back to its normal functioning in the economy (Irwin 2014; Parrott and Zandi 2013).

These four factors generate such uncertainty about the outlook for home ownership that it may be unwise to simply assume that any "normal" rate of home ownership will prevail. Should credit restraints continue as they were in mid-2014, future home ownership trajectories would more closely resemble those of

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census and the 2012 American Community Survey). Loss of wealth (net worth in 2010 dollars, defined as assets minus liabilities) was three times as severe in 2010 than in 2001, declining 36.4 percent among whites, 39.2 percent among Hispanics, and 67.6 percent among African Americans (based on our tabulations from the 2001 and 2010 Survey of Consumer Finances, or SCF). Asians were the only group that did not suffer a decline in income, but no data are reported on their wealth in the SCF.

10. The Mortgage Credit Availability Index stood at 135 in mid-2014, compared with an average of 500 in 2000–2002. It reached nearly 800 at the height of the bubble, when all manner of no-documentation and easy-qualification loans were offered. Data were kindly supplied by Michael Fratantoni, chief economist at the Mortgage Bankers Association.

the past few years, but a lessening of restraints would move the rate back to the more typical pattern prevailing before the bubble. At the same time, there is little uncertainty about the growing diversity, except regarding whether greater equity will be obtained for segments of the population that have been historically disadvantaged. The persistence of a high preference for home ownership may still be in doubt, however, and this is the subject of the next section.

THE SURVEY EVIDENCE ON PREFERENCE FOR HOME OWNERSHIP

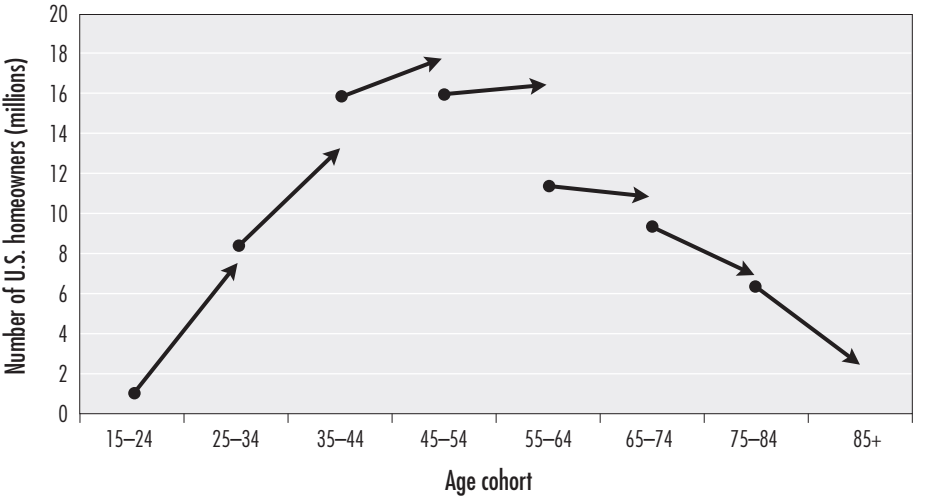
Recent survey evidence suggests that millennials' desire for home ownership has not disappeared but may merely have been shelved during the years of a sluggish economy. The large National Housing Survey carried out by Fannie Mae reveals broad support for home ownership among young renters (defined as household heads under age 40). In the third-quarter survey of 2013, 76 percent of young renters said that owning is financially better than renting, 90 percent said that they are likely to buy at some point in their lives, and 49 percent said that they are likely to buy the next time they move (Fannie Mae 2014).

As for the assumption that the young have been traumatized about home buying by watching what has happened to others, analysis of Fannie Mae survey data from an earlier year by Drew and Herbert (2012) found little statistical support for that belief. Neither exposure to house price declines nor witnessing the financial fallout of others has had much lasting effect on individuals' own preferences for home ownership. Overall, these opinion data suggest that the desire for home ownership is alive and well.

When survey respondents were asked how optimistic or pessimistic they were about the housing market and whether in general they felt this was a good time to buy a home, 66 percent of young renters said that it was either a "very good" or a "somewhat good" time to buy. Over half (53 percent) said that they thought prices were going up, and only 7 percent expected them to go down (Fannie Mae 2014, slides 34 and 35).

Nonetheless, other survey evidence, produced for the MacArthur Foundation, showed that 70 percent of the public believes that "we are still in the midst of the housing crisis or that the worst is yet to come" (Hart Research Associates 2014, slide 25). In the current climate, renting has become more appealing and buying less appealing, and a majority, including 62 percent of young adults ages 18–34, think that "families are less likely to build equity through homeownership today than they were two to three decades ago" (Hart Research Associates 2014, slide 31). The survey also found that 85 percent of non-homeowners ages 18–34 still aspire to be homeowners, and 52 percent of the young feel that home ownership is an excellent long-term investment. In addition, the MacArthur survey found widespread concerns about affordability among renters and owners, and respondents said that they want the government to give more attention to the problems of renters. Finally, fully 66 percent of the young said that they believe renters can be just as successful as owners in their ability to achieve the American dream. Yet the aspiration for home ownership remains strong.

Figure 2.15
Cohort Trajectories of U.S. Homeowners by Age, 2000 and 2010 (in millions)



Note: Each cohort is observed first in 2000 and then in 2010.
Sources: Data from 2000 and 2010 Census Summary File-1, U.S. Census Bureau.

COHORT PROGRESS INTO HOME OWNERSHIP

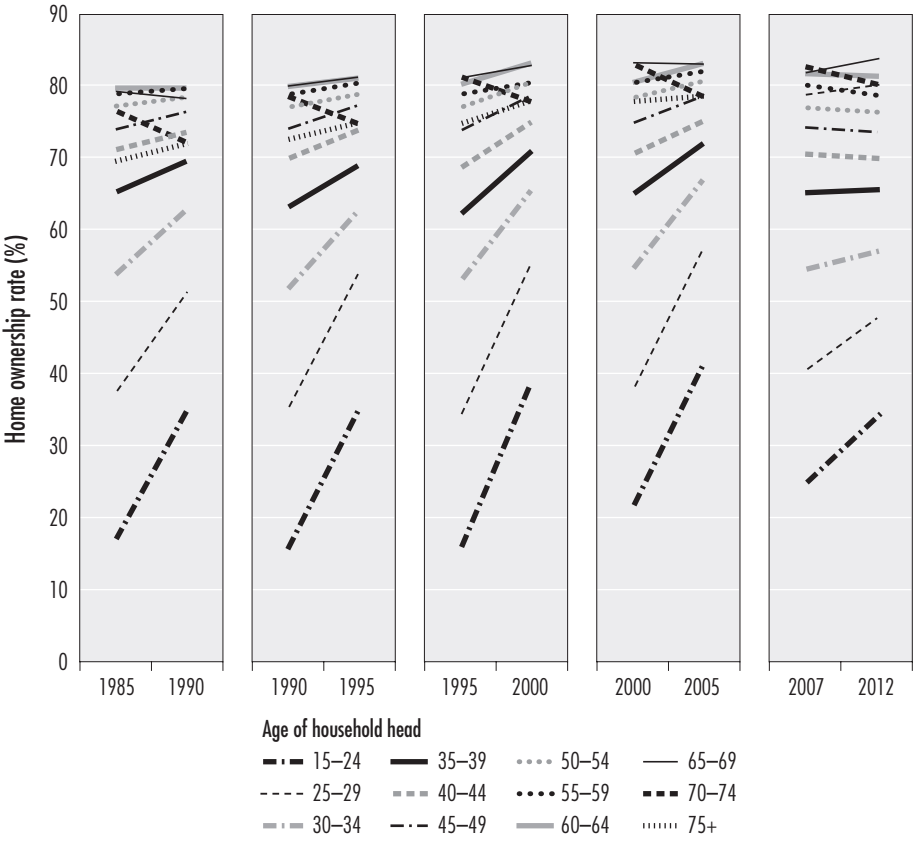
Aspiration for home ownership does not imply that households expect to achieve it immediately. In fact, acquisition of home ownership on average has a distinct life-cycle pattern, rapidly increasing through age 35 and then more moderately to age 55. From age 55 to 74, slight increases may still continue in some states or metropolitan areas, while home ownership begins to decline after age 65 in most others.[11] After age 75, the number of homeowners begins to contract sharply because of retirement relocation, health needs, and ultimately death. These dynamics are clearly shown in figure 2.15.[12] The two large cohorts at their peak of home ownership are baby boomers. After 2020, they can be expected to fully enter the stage of net housing sellers,[13] a reversal from earlier decades, when these large co-

11. Myers and Ryu (2008) identified a few states (Arizona, Florida, Nevada, and South Carolina, all retirement states) where the number of homeowners at ages 65–69 was still growing, but in most of the country, especially the Midwest and Northeast, substantial outflows were in progress by that age. Bear in mind that at older ages, home ownership rates (based on the surviving population) remain high, but the absolute numbers are falling.

12. On the very considerable differences between age cross-sectional and cohort longitudinal analysis, see Pitkin and Myers (1994) and Myers (1999). For a telling cohort view on mortgage debt, see Masnick, Di, and Belsky (2006).

13. Net sellers are homeowners who sell their principal residence and do not purchase a replacement.

Figure 2.16
Five-Year Cohort Progress into Home Ownership by Age at Beginning, 1985–2012

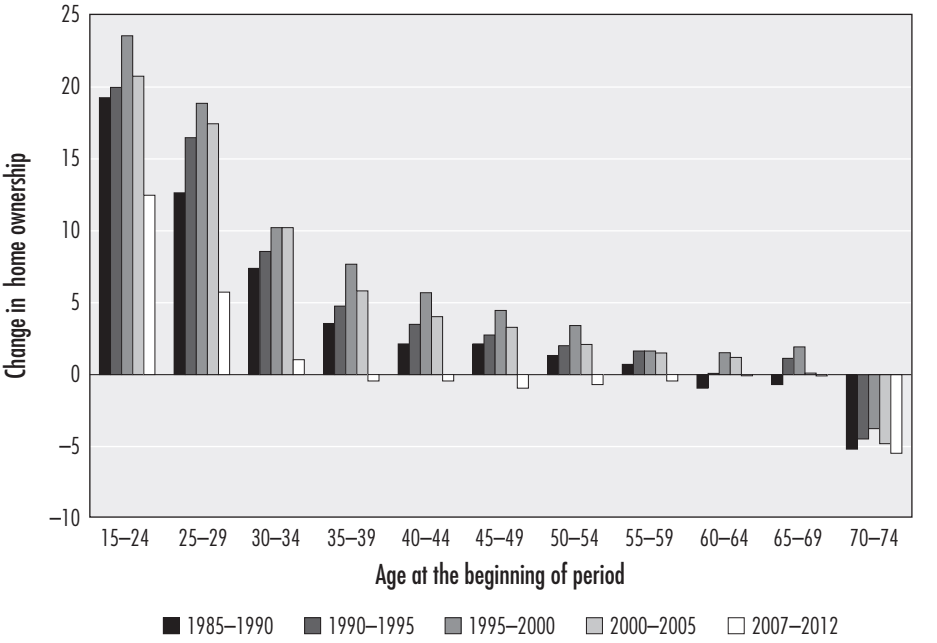


Note: The age of householder is the head's age at the beginning of each 5-year period.
Source: Data from 1985–2012 Housing Vacancy Survey, U.S. Census Bureau.

horts' acquisitions propelled the housing market forward. The greatest question today is whether the large millennial generation (under age 35) can grow into the role of propelling the housing market.

A closer look at the changes in the cohorts' home ownership rates is necessary. Over the past 20 years, even during the housing bubble, the attainment of home ownership advanced at a remarkably consistent pace, most sharply among young adults and more moderately among middle-aged cohorts. This phenomenon can be seen in figure 2.16, with the slopes in each five-year period indicating the gain in home ownership rates as each cohort grew five years older. Young adults rapidly rose into the ranks of homeowners, and middle-agers continued

Figure 2.17
Comparison of Cohorts' Incremental Progress into Home Ownership, 1985–2012



Source: Data from 1985–2012 Housing Vacancy Survey, U.S. Census Bureau.

to increase their holdings as well. It is remarkable how similar the rate of advancement each five years was, with the exception of the most recent period. For example, in 1995, 34 percent of households headed by a person age 25–29 were homeowners, and by 2000, after the cohort had advanced another five years in age, that proportion had climbed to 54 percent, a gain of 20 percentage points. In contrast, the five-year period beginning in 2007 was much more grim. Young people still scrambled upward, but at less than half the rate as before, and middle-agers actually fell from home ownership. The total number of homeowners declined, and the overall home ownership rate fell as well.

Despite the apparent similarities among cohorts before the Great Recession, closer examination reveals distinct differences in other periods as well. The failure to progress during the Great Recession and its aftermath is best seen by contrasting the net increments in home ownership rates achieved by cohorts passing through particular age ranges (figure 2.17). Certainly, diminished and even negative progress into home ownership accrued in the most recent period. Yet the gains were not constant for cohorts in the preceding five-year periods. Cohorts' movement into home ownership expanded at an increasing rate, accelerating from 1985–1990 to 1995–2000, when the fastest gains were made, before slow-

ing in 2000–2005 and finally collapsing at the end of the decade. (The figure omits the disruption between 2005 and 2007.)

INSIGHTS FROM A GENERATIONAL MOMENTUM MODEL OF HOME OWNERSHIP TRENDS

It is helpful to think of the overall home ownership rate not as an abstract number, but as an average summation across all cohorts of the progress each has attained at a given moment in time. Especially useful in making projections is estimating the future status of each cohort relative to its own historical trajectory by adding the "normal" or expected increments in home ownership accrued at each advancing age, as observed for preceding cohorts. These increments vary across decades subject to market forces and the constraints reviewed earlier in this chapter. While older cohorts are relatively immune to current conditions, continuing to own homes acquired in prior decades, younger cohorts are more susceptible to current incentives.

Cohort trajectories possess powerful inertia that sustains those who are already advantaged and impedes those who are struggling for entry-level gains. Even with rapid improvement in the economic climate for home buying, including the much-needed increase in access to mortgage credit (Parrott and Zandi 2013), it is uncertain how rapidly the younger cohorts will begin to catch up or if they can ever close the gaps that have been opened. By 2010, the home ownership rates of cohorts arriving at ages 25–54 were tracking 5 percent lower than their predecessors at those ages in 1990. To fully restore the former rate of home ownership, entering cohorts would need to reestablish the former upward trajectories that prevailed before 2000, plus make up an additional amount resulting from any accumulated prior deficit. This will not be easily attainable within a decade's time. Accumulated deficits in home ownership could be long-lasting and even grow larger, especially among the millennials, who have sustained such economic damage from the recession and its aftermath.[14]

Meanwhile, the advantaged older generation retains its very high home ownership levels. Cohorts currently age 55 and older still carry a lot of weight in the overall home ownership rate (accounting for 40.4 percent of all households and 48.0 percent of homeowners in 2010), but their influence will diminish over time, both as they age out of the system and as growing numbers of young cohorts enter at the bottom. The overall home ownership rate will inexorably decline from the decreasing weight of these high-owner cohorts. The longer the younger generation lags behind, and the greater share of the adult population they grow

14. High unemployment rates, delayed employment progress, and depressed future earnings have been particular consequences of past recessions for recent graduates and are especially likely in the aftermath of the Great Recession (Kahn 2010). According to Jason Furman, chairman of the president's Council of Economic Advisers, these factors, together with high student loan debt, are reasons for anticipating a slower recovery by millennials in the housing market (Furman 2014).

to be, the greater will be the downward pull on the national home ownership rate. Powerful insights are yielded from the "generational momentum" model of home ownership that is proposed here.

SCENARIO PROJECTIONS OF THE HOME OWNERSHIP RATE

There is no way to predict how this will all play out, but it is instructive to prepare scenarios based on recent and past historical precedent. One strategy is to define alternative paths for the national home ownership rate, none of which is claimed to be the best prediction of what is likely to unfold, but all of which are instructive about the possibilities they describe. Each scenario is essentially a calculation of the net results of generational momentum under assumptions of a recovery that will return to earlier regimes of home buying. Examining the different scenarios and their outcomes could help inform debates over the future of home ownership. Rather than simply assume that home ownership will hold steady at around 64 percent as before, let's look at the evidence based on the momentum already present in the population of households.

Defining the Scenarios The four scenarios proposed here range from most pessimistic to most optimistic, with two middle scenarios that are more probable. They are based on previously observed rates of cohort progress into home ownership and are mixes of the experiences in different decades. (The scenarios are linked only to eras and not to any underlying mechanisms, such as differences in credit availability.) When the housing market "returns to normal," presumably it will return to something resembling the cohort progress into home ownership that has been observed in previous periods. It is the hypothetical construction of "normal" that defines the alternative scenarios.

Scenario 1 assumes the same rate of cohort progress toward home ownership in the future as existed from 2006 to 2012. Each cohort will retrace the same pathway of failure, locked perpetually in the Great Recession. This alternative is for reference only and is not a likely outcome.

Scenario 2 imagines a weak recovery that is very possible. In the immediate period from 2012 to 2018, cohort progress will revive halfway from the recession pattern to the average of the prerecession era, 1982–2006. Thereafter, the cohorts' progress is assumed to advance three-quarters of the way to the prerecession average. This assumes that cohorts never return fully to their prior rates of incremental growth in home ownership.

Scenario 3 is also possible, but it imagines a stronger rebound that will, after 2018, achieve the full average of prerecession progress into home ownership. This assumes full recovery to traditional rates of cohort incremental growth in home ownership.

Scenario 4 is an unlikely path that imagines complete and full rebound to the prerecession average that would have started in 2012. Three years into the period, we know this is no longer possible, but this alternative can provide a reference of maximum optimism.

Note that all four scenarios concentrate on restoring the rate of home buying, not on erasing past deficits that may have accumulated prior to 2012. For that catch-up to occur, cohorts would need to acquire homes at a pace even faster than the prerecession average. Such an aggressive assumption does not seem supportable at this time.

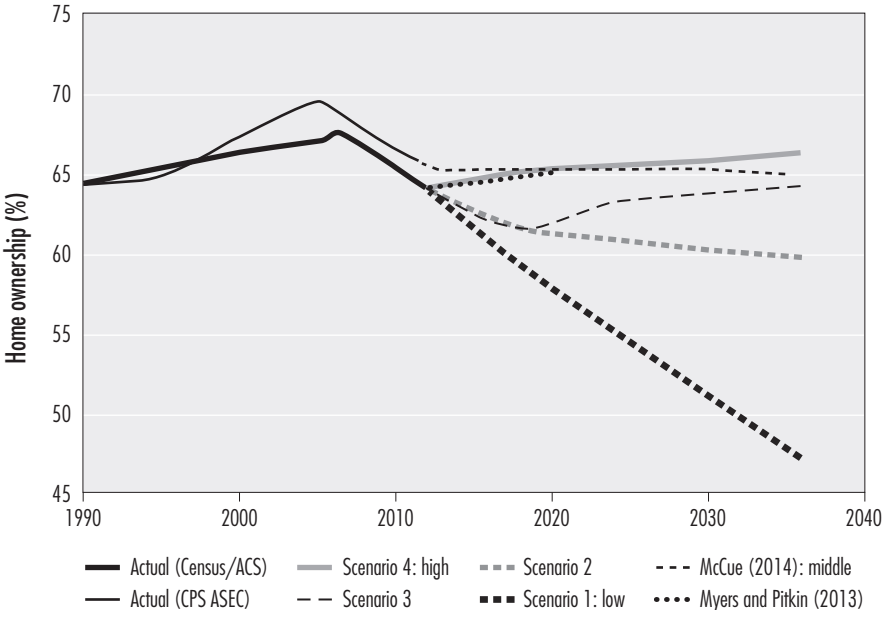
There is also the question of how to handle new cohorts yet to emerge into adulthood. Because there is no history on these cohorts, we have held their starting positions equal to those of young cohorts observed in 2012. It is possible that incoming cohorts untouched by the Great Recession might enter with a stronger appetite for home ownership. Yet it is equally possible that new entrants could follow the long-run trend toward lower home ownership rates at very young ages. On balance, it is wisest to hold them constant with the most recent cohort at entry.

In arranging the data to execute these scenarios, we had to contend with a host of inconsistencies among data sets, as well as sampling errors. We desired a large sample for estimating detailed cohorts before and after the recession, which was obtained by linking the decennial census of 2000 and the 2006 and 2012 American Community Survey (ACS). The historical rates of cohort progress were derived from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC).[15] To take advantage of the timing of the census and the onset of the ACS, as well as the timing relative to the housing financial crisis, we elected to analyze two 6-year periods, 2000–2006 and 2006–2012. We continued this six-year sequence both before and after the core analysis period. To correspond to the periods, we grouped households into six-year age groups as well.

Comparing the Scenario Projections In figure 2.18, the projected home ownership rate under each scenario is displayed to 2036 and compared with home ownership rates since 1980 to gain perspective. Also shown are the two other existing projections of home ownership, Myers and Pitkin (2013) and McCue (2014). The latter projections are calibrated to a CPS data series that runs higher in terms of home ownership, but it is useful for comparison because of its trend, which is very slightly downward through 2035. The Myers-Pitkin venture looked only one decade ahead, census to census, and was intended to inform state-level

15. The CPS ASEC data were also used in 2000, in combination with earlier years in that data series, in order to derive internally consistent rates of change. For the post-2000 period, the ACS appears well calibrated to the 2000 census. Public Use Microdata Sample (PUMS) files were used in all these data sets, allowing for the definition of six-year age cohorts in order to match the timing of the 2000–2006 housing expansion, followed by the 2006–2012 recession and recovery. The Housing Vacancy Survey (HVS) does not provide a PUMS file and also relies on a much smaller sample size than the ACS. The CPS ASEC and ACS both contain a population universe instead of the household universe of the HVS, which allows the home ownership rates per household to be adjusted for changes in headship rates per capita, as discussed in Yu and Myers (2010) and Haurin and Rosenthal (2007).

Figure 2.18
Home Ownership Rates Resulting from the Scenarios, 1980–2036



Source: Based on project model constructed from cohort data in the 1981–2013 Current Population Survey Annual Social and Economic Supplement, U.S. Census Bureau.

analysis, not provide a detailed national projection. This projection appears optimistic and shows home ownership moving upward by nearly a full point.

Scenario 1 represents a doomsday vision: the home ownership rate is 55.0 percent in 2024 and falls further to 47.1 percent by 2036. This repeats the losses of the Great Recession for each successive cohort and perpetuates the decline in home ownership. The previously established high home ownership rates of older cohorts keep this projection from dropping even more sharply.

Scenario 2 shows home ownership starting to pull out of the decline, staying just above 60 percent by 2024, but then falling further by 2036.

Scenario 3 is more optimistic that cohort gains in home ownership can return to the prerecession average and actually manage to regain lost ground by 2024. Eventually, by 2036, the home ownership rate rises back to 64.0 percent, just above where it started in 2012. The gains in this scenario accrue because the prerecession average rate of cohort progress is higher than the rates in the bubble and recession periods of the 2000s.

The final scenario is the most bullish, never declining and instead reaching 65.4 percent in 2024 and 66.1 percent in 2036. This is the trajectory that might have obtained if not for the long-delayed recovery period after the recession.

These scenarios reveal the momentum contained in the demographic structure of home ownership. The Great Recession was a one-time event whose impacts are still reverberating. All of the cohorts sustained losses that have been carried forward, and to the degree that cohort progress is not operating at normal strength, the cohorts continue to lag further behind, pulling down the overall home ownership rate of the nation. As time passes, new cohorts will enter this market with slow advancement into home ownership and gradually fill the population structure with cohorts characterized by depressed home ownership gains. Meanwhile, the high-home-ownership cohorts of earlier years will age out of the market and sell in an increasingly weak marketplace with fewer entry-level and move-up home buyers, the latter of which will be needed to buy higher-priced homes from the baby boomers. The stronger the home ownership of the younger generation, the better off seniors will be at the time of sale.

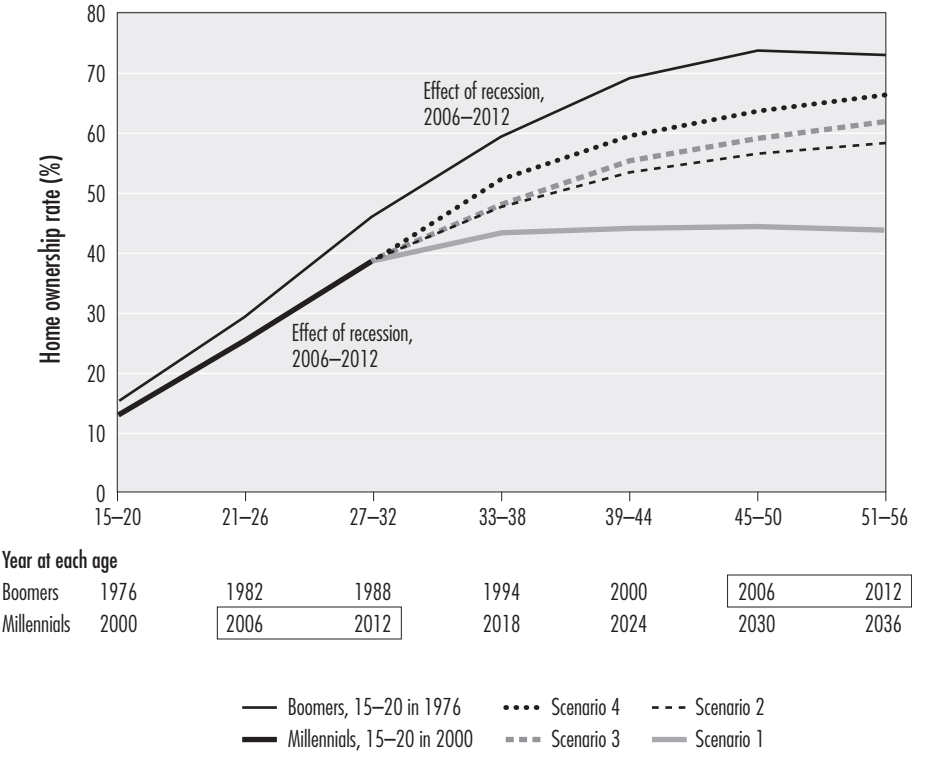
Comparing the Millennials and the Baby Boomers It may be useful to compare two cohorts, one born from 1956 to 1961, representing the younger portion of the baby boomers, and the other born from 1980 to 1985, representing the older portion of the millennials. Born 24 years apart, these two cohorts occupy very different phases of history. The older cohort had reached ages 51–56 by 2012 and achieved most of its lifetime housing gains during the booms of the late 1980s, 1990s, and early 2000s, all before the onset of the Great Recession. In contrast, members of the younger cohort were only ages 27–32 in 2012. Their future home ownership rate is shown under the four scenarios in figure 2.19.

The home ownership rate of the boomer cohort normally would have continued to rise slowly through at least age 65, but it was slightly dampened between 2006 and 2012 while boomers were still in their 50s. Nonetheless, their rate was still a very high 73.0 percent. In contrast, the millennial cohort's home ownership rate in 2012 was well below the boomer cohort's when the latter was the same age, having been stunted in the normally expected rise during this key age range for home acquisition. Projected increases from this point forward vary by scenario, with home ownership rates ranging between 43.2 and 52.4 percent in 2018. At the prime age range for home ownership attainment of 33–38, the boomer cohort by comparison had attained a home ownership rate of 59.2 percent.

The millennial cohort is blocked from moving to the high end of this projection range by the set of constraining forces discussed earlier in this chapter. The principal area of policy leverage would be relaxing the current restrictive access to mortgage credit. Under scenarios 3 and 4, a revival of the overall national home ownership rate would be expected, but this would require actively involving a much larger share of millennials than is currently the case.

What the alternative scenarios imply for urban growth and development remains to be determined. However, it appears that the revitalization of cities should continue to strengthen for at least the remainder of the present decade, and it seems that the growth of suburban home ownership, and of home building, is likely to remain subdued.

Figure 2.19
Lifetime Trajectory of Home Ownership Rates of Baby Boomers (Actual) and Millennials (Projected)



Source: Data from Current Population Survey, Annual Social and Economic Supplement, 1975–2013, U.S. Census Bureau.

Conclusions

This chapter offers a broad tour of demographic trends and their implications for urban growth and development. The unique episode of the Great Recession induced abrupt short-term shifts in behavior that are continuing, further delaying recovery. Those recession-derived short-term changes are overlaid on, and sometimes reinforce, secular long-term trends. Yet it remains difficult to say whether the newest short-term changes are the beginning of a new long-run future, the so-called new normal.

Due to the lack of longer-term information, the deluge of annual data on population shifts and housing market trends has been the only basis for forming an outlook on the future. This chapter seeks to correct that bias toward the short term, even while accepting that there may be a long-term break with past behavior. Among the guideposts that is most reliable and of deepest significance is the

aging of the population, including not just the aging of baby boomers, who will remake Americans' notions of old age and retirement, but also the aging of millennials, who are beginning to arrive at the critical life stage for family formation, career building in chosen occupations, and entry into home ownership.

The use of projections here is less to make a point prediction than to provide a frame of reference for judging how much the "normal" behaviors that prevailed in the past may differ in the future. The chapter highlights some stark differences between one decade (the 1990s) and the next (the 2000s and the 2010s). Threaded across the decades are the careers of individuals and the generational momentum of cohorts. When connected to history in this way, projections provide a long-term temporal framework that is useful in helping to evaluate current policy choices.

The millennial generation is now receiving widespread attention because new generations are often the drivers of social change. Equally important is that the millennials are a larger cohort than the undersized cohorts they are succeeding, even larger than the baby boom generation itself, and so by sheer numbers alone they bring added vitality to urban areas. But there is great doubt surrounding the millennials, because they came of age in the aftermath of the Great Recession and have thus endured greater economic challenges, and also because of their racial and ethnic diversity. The importance of the millennials has been highlighted in every phase of this study.

In the end, the millennials' lifestyles and economic well-being are still in a formative stage. The end results are still unknown, but what is certain is that if things do not go well for the millennials, things will not go well for seniors either. Nothing points up this dependency as much as the housing market, where massive numbers of baby boomers will be looking to sell their homes to the millennials. The United States needs the millennials to succeed—to get a good education and good jobs, to become strong taxpayers in order to support the rising senior population, and to buy baby boomers' houses at a good price. Already the millennials have done much to revitalize inner cities, but can they help the rest of the country, too?

Alonso's "population factor" has returned to prominence in the analysis of housing, urban structure, and future development patterns. Perhaps the newfound interest in it is due to the rapid demographic changes under way, or it might be attributed to the great economic and political uncertainties, which make demographics seem a more secure base. Certainly, after the severe financial crisis, there seems to be merit in returning to the timeless estimation of housing demand by keeping close track of the people needed to fill the houses.

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COMMENTARY
Ann Forsyth

Open a major urban plan from the 1940s or early 1950s, and you will likely see a plan that underestimated urban population growth. In the places where such documents were produced, planners were tricked into complacency by the Depression and World War II, with their low birthrates and consumer frugality in terms of housing options. Open a plan from the late 1960s or early 1970s, and you will likely see the opposite, with various countries swept up by the baby boom and the growth in urban jobs. By the 1980s, planners had learned their lesson and often hedged their bets—planning, for example, for a certain population size but leaving the time frame open (or vice versa).

In addition to population, many other planning-relevant trends are hard to predict. Fossil fuels seemed boundless in the early postwar period, but by the 1970s declining U.S. production and geopolitical events in the Middle East were leading to calls for constraint. More recently, there has been relative abundance resulting from new production and reduced demand given the rise of alternative energy sources. In early postwar urban plans, women and men were assumed to play fairly rigid gender roles, but now women make up a large proportion of the workforce and the proliferation of different gender paths has led to substantial variation in household arrangements. Immigration rates, household formation patterns, and preferences by various populations for central city versus suburban living, as well as for lower- versus higher-density environments in the suburbs, have all been subject to change. As a result, over the past several decades it has been far from easy for planners to predict the future urban context or to make plans to channel development and redevelopment in positive ways.

In this situation, Myers and Lee's opening statement is all the more bold: "The future course of population change, housing, and urban development has rarely, if ever, been so uncertain." Certainly, they may be right, and they provide an extremely thoughtful assessment of the relative strength of the short-term effects of the recession on long-term trends in housing and urbanization in the United States. Focusing on overall age structure, immigration trends, the situation of households in their 20s, racial and economic diversity, and the rising proportion of seniors, they paint a picture in which long- and short-term trends are frequently at odds. The trick is to figure which will win out. Was the recession a game changer (particularly for the young, whose early economic lives have been strongly shaped by it)? Or did it merely slow down some trends (such as younger people moving out of the core city into bigger, more family-oriented houses) that will eventually return to previous patterns?

How should planners respond? Obviously, while the current period has a great amount of uncertainty, it is not completely without precedent. Indeed, even some of the terminology used today repeats that of earlier times. For example, Myers and Lee cite debates about the "next America" (Taylor 2014), a term that

was used in relation to Columbia, Maryland, in the late 1960s (Forsyth 2005). Although the changes being described were somewhat different then, in the late 1960s and early 1970s there was a similar sense of major transitions being afoot as the early baby boomers came of age and liberation movements emerged.

Over the years, those concerned with making projections for the long term have learned from such periods and focused on developing various possible scenarios rather than making hard-and-fast predictions. Indeed, Dowell Myers has been a leader in this area (Myers and Kitsuse 2000). In industries such as oil and gas exploration, Royal Dutch Shell is well known for its alternative plausible scenarios about the future that help the company prepare for it (Wack 1985; Forsyth 2014). Planners, of course, want to shape a better future for a broad public, rather than just navigate through a changing context, but they should aim to produce plans that consider a range of alternative futures.

Myers and Lee address a few issues that might affect the future in different ways. One of these is the back-to-the-city movement among college-educated 25- to 34-year-olds, who are moving into core cities without substantial new construction. This relatively small group is likely to replace out-moving older adults and lower-income populations. Although they outline "a weak trend of population movement back into the city," they propose, but are not certain, that this may be a short-term aftereffect of the recession. This is worthy of analysis, as creating center cities and suburban downtowns that are cost-effective to service has long been an aim in planning for sustainable, livable, or healthy urban areas. There could be many benefits for those wanting to implement such plans from capturing these preferences and minimizing negative effects of displacement through new construction.

More complex in terms of planning relevance is the issue of home ownership rates. Myers and Lee propose a series of intriguingly different scenarios. In a world in which tenure maps cleanly onto housing type—renters in attached units, owners in detached ones—the mix of owners and renters has important implications for the demand for different unit types and, by extension, different locations. This is a big planning issue. As the recent recession has demonstrated, however, the match between type and tenure is not so clear: many formerly owner-occupied units are now rentals. The kinds of rental and owner-occupied units also vary within the United States and internationally. If more people rent, rental units will need to be more diverse than just starter apartments and luxury villas, making them more similar to owner-occupied units.

The future has always been notoriously difficult to predict. One of my favorite metropolitan plans is the 1947 comprehensive city plan for St. Louis by the distinguished early city planner Harland Bartholomew. It is a large and comprehensive plan and includes an air transportation element proposing 35 airports, based on the likely (at the time) development of fairly localized air transportation in the coming decades (City of St. Louis 1947). Obviously, that has not come to pass. In the end, offering specific predictions is less useful than creating plans that

can lead to positive outcomes given multiple plausible futures. It seems to be the time to invest in doing this better.

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3

Monitoring the Share of Land in Streets: Public Works and the Quality of Global Urban Expansion

Shlomo Angel

Securing an Adequate Share of Land in Streets

As cities expand, the land necessary for public streets, infrastructure networks, and open spaces must be firmly secured, preferably in advance of development. For cities to be efficient, equitable, and sustainable, there must be a balance between the shares of public and private land.

When too much land is in public ownership and public use, as was the case in Moscow between 1917 and 1989, decisions about what to build on a given plot are often made without reference to competing demands that seek to realize the full potential of the land—or to use the language of urban economics, to put the land to its "highest and best use." Land was typically allocated with the objective of minimizing the bureaucratic costs plus the out-of-pocket costs to develop it. As a result, there was little incentive to recycle unused or underused land in city centers—often costly in both bureaucratic and financial terms—and a preference

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for greenfield projects on the urban fringe instead. Over time, residential densities in Moscow increased rather than decreased with distance from the city center, reducing overall access in the city. This unnecessarily raised the average length of trips, with the concomitant energy loss and increased pollution (Bertaud and Renaud 1995).

Similar distortions occur when municipalities do not own all the land but exercise strong powers over its designated use, as is currently the case in Israel. Israeli planning law mandates that as much as 40 percent of any land to be converted to urban use be transferred to the municipality for public use, free of charge. This percentage is now a baseline to which municipalities and other government ministries, such as the Education or Interior Ministry, add land requirements for schools, parks, and the like, with the result that the share of land claimed to be necessary for public use is much higher. The Israel Land Authority, which owns many large parcels of land required for urban expansion, now refuses to allow the share of land for public use to exceed 65 percent. Strange as it may seem, were it not for the authority's ability to force the hands of municipalities, public authorities would seize more than 70 percent of the land for public use, often holding it in reserve for future use (and possibly for sale or lease to private enterprises as well).[1] This practice is no doubt excessive, reflecting a rather bureaucratic approach to city planning that is out of touch with the way successful cities develop and thrive. There must be ample land in private use—available for production, commerce, civic activities, and residences—for the city to develop and thrive. And it is in the public interest to make that possible, at the very least to generate the resources needed to invest in and operate a full complement of public services.

Bangkok in the 1980s, in sharp contrast to Moscow during the same period, was an unfettered, laissez-faire land market that ensured an ample supply of land for urban expansion and an adequate supply of affordable housing. That being said, Bangkok failed miserably when it came to allocating enough land for roads. More specifically, it failed to provide adequate land for its arterial road network—the network that typically carries public transport as well as the city's primary infrastructure grid (water, sewer, and storm drainage lines)—as well as for its local street networks. This failure has resulted in large losses in productivity and efficiency, as well as massive shortages of essential infrastructure services, which have greatly compromised the city's quality of life.

The road network in every country typically forms a three-tier hierarchy of primary, secondary, and tertiary roads. Central or state governments usually plan, acquire land for, finance, construct, and maintain the primary intercity road network of the entire country. Municipalities typically plan, acquire land for,

1. This information comes from a conversation in January 2012 with the architects Amir Kolker and Ofer Kolker, who recently completed the master plan for the expansion of the Israeli city Rishon LeZion.

finance, construct, and maintain the secondary, or arterial, road network within their jurisdictions. It is this network that connects all parts of the city, allowing it to function as one large and integrated market for labor, goods, and services, rather than as a mosaic of fragmented communities. In a minority of cases, as in the 1811 Commissioners' Plan (figure 3.1), the municipality plans and builds the tertiary road network as well. This allows for the homogenization of the urban territory, in the spirit of transforming disparate strangers into citizens, creating a large public sphere for bringing people together, removing the differentiations between rich and poor and between formal and informal, and equalizing the efficient distribution of public services.

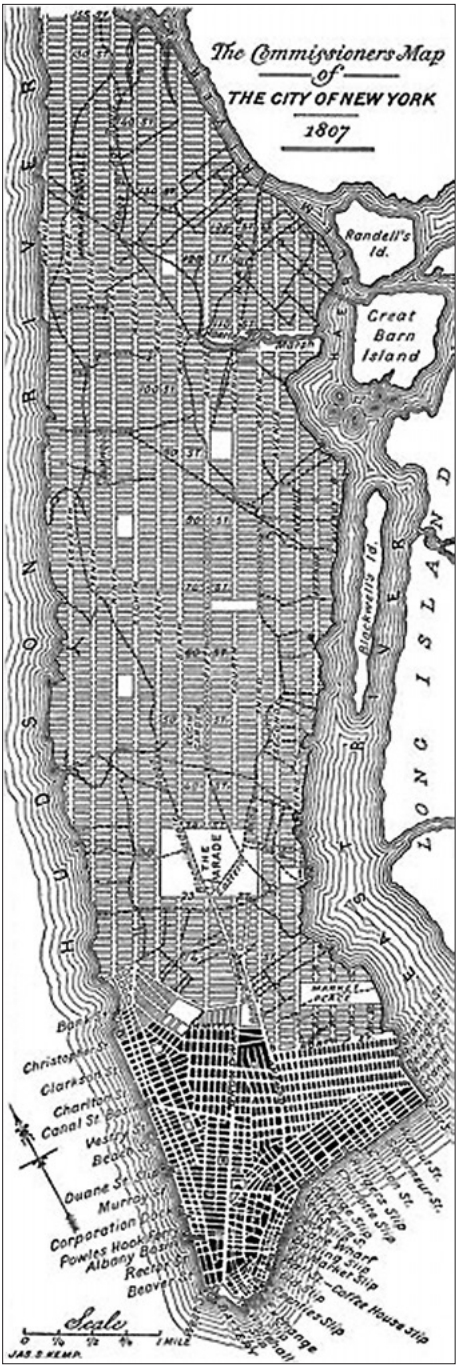
In most cases, private developers of residential neighborhoods or of commercial, office, and industrial projects plan, acquire land for, finance, and construct the tertiary roads that connect individual buildings within their projects to the rest of the city. In some instances, private developers must abide by regulations requiring that adequate land be allocated for streets in a planned fashion in advance of any construction. In many other cases, especially on the rapidly expanding fringes of cities in developing countries, regulations are not enforced. Buildings sprout on the urban periphery in a disorderly fashion, with narrow lanes and sometimes only walkways connecting them to the rest of the city. In yet other cases, "informal" private developers subdivide land into plots for sale, allocating the absolute minimum amount of land for roads and lanes to provide access to these plots. Atomistic households, informal developers, or professional "squatters" who subdivide and sell unserviced plots, and even formal developers who assemble and transform large tracts of land into residential subdivisions, can all urbanize areas on the periphery of cities while allocating a share of the land for local streets. But such actions on the part of market agents typically fall short of providing for an adequate network of arterial roads.

ARTERIAL ROADS

In 1924, Los Angeles planner Gordon Whitnall wrote, "When we faced the matter of subdivisions in the County of Los Angeles . . . we reached the conclusion that it would be absolutely necessary to go out and try to beat the subdividers to it by laying out adequate systems of primary and secondary highways at least, thus obtaining the necessary areas for highways and boulevards" (cited in Foster 1980, 470).

Arterial roads are classic public goods (i.e., users cannot be effectively excluded from using them). Since they are public goods, there is no market mechanism that can ensure they are in adequate supply in appropriate locations. In other words, a shortage of arterial roads is a form of market failure. Arterial roads need to be financed by municipal budgets rather than from tolls or revenues from the sale of plots abutting them because the market typically fails to supply them in adequate quantities. Given the strained budgets of municipalities, especially in developing countries, and their limited ability to borrow funds, it is no wonder that the arterial road network in urban areas is typically undersupplied.

Figure 3.1
The 1811 Commissioners' Plan for Manhattan, New York



Source: Bridges (1811).

Similarly, in larger metropolitan areas with a multiplicity of municipalities, there are inherent difficulties in planning and building arterial roads that link the metropolitan area together to form a single labor market, the key productive advantage of larger cities over smaller ones. Such artificial shortages cannot be remedied through the interaction of supply and demand in land markets on the urban periphery. And they will not likely be remedied correctly through the actions of dysfunctional or myopic public authorities either. It is important that people understand why.

In recent decades, frustrations with public authorities—often rife with inefficiency and corruption, beholden to powerful private interests, and perceived by the general public as no longer acting in its interest—has led intellectuals, opinion leaders, and political movements to champion the free market as the only workable system for modern postindustrial societies. There have been repeated calls for privatizing public services such as water, sewer, transportation, and power; for lessening the regulation of businesses to make them more efficient and more creative; and for lowering local tax rates (and sometimes national tax rates as well), which would compromise the ability of local governments to invest in and maintain public facilities and essential services. There have even been calls for weakening the ability of public authorities to acquire private property for public use through eminent domain, a power that is essential for laying out both primary intercity roads and secondary arterial roads.

Some of these calls resonate with many people. There is no question that the private sector has played a very useful role in building cities and in extending them into the urban periphery. Similarly, there is no question that the public sector has, for example, utterly failed to supply affordable housing, or even affordable sites and services, on the required scale. The private sector—through the actions of formal and informal developers, through the building activities of firms and households, and through harnessing the financial resources of international capital as well as those of neighborhoods and families—has managed to build millions of houses in thousands of cities, with the surprising result that only a very small share of households in any city (less than three per thousand) remain homeless (Angel 2010).

Unfortunately, when it comes to preparing cities for expansion, people's fervent hopes that the private sector, relying entirely on free-market transactions, can ensure efficient—let alone equitable or sustainable—development of the metropolitan fringe are entirely misplaced. For the urban periphery to become an integral part of the metropolis as a whole, it must contain a wide network of well-connected arterial roads. Yet there is simply no market mechanism that can create such a network. If a private entrepreneur wanted to build a long road from A to B, for example, she would be right to want to make that road as straight as possible. Doing so would reduce the cost of its right-of-way and construction, as well as the time users would need to traverse it. But once the entrepreneur decides on the alignment of the road, she loses any leverage she might have had to bargain with the owners of the land for the road. Each owner now has a mo-

nopoly on his or her land and can set a price that is many times that of the value of nearby properties.

Only public authorities can plan roads that traverse the land of multiple owners, and only public authorities can acquire such land using eminent domain, which allows them to pay a price equal to the prevailing value of adjacent properties outside the right-of-way. Eminent domain is necessary whenever the public needs to assemble land for public use from a large number of landowners, each of whom can refuse to sell. That power must remain in the public realm; it cannot be privatized. And because it cannot be privatized, the market cannot be counted on to plan and prepare for urban expansion in an efficient manner.

Urban expansion in the real world comes about through the merging of two spheres: one embodies the essential public actions that make cities habitable, and the other encompasses the necessary private actions that make cities productive and livable. Neither the public nor the private sphere can survive or thrive on its own. For public goods such as arterial roads to be constructed in a planned and timely fashion, citizens must come together as a public rather than remain as private individuals. To be of any use to individuals, private goods, such as serviced plots of land for homes and businesses, need these underlying public goods to be in place.

The absence or near absence of an arterial road grid in areas of expansion has a number of negative consequences. For one, the city expands in a starlike fashion along the primary road network—the main roads that connect it to other cities in the country or to minor roads that run to towns and villages on its periphery. This design renders the city less compact—that is, less like a circle—resulting in longer infrastructure lines and longer commute distances than those in more-compact cities. In addition, the main transportation routes remain radial in nature, linking the city center to the outlying suburbs but failing to link the suburbs to one another. This layout benefits workplaces in central city locations, increasing congestion at the core but not necessarily slowing down the movement of workplaces out to the suburbs. In most cities today, the great majority of jobs are outside the city center—in the United States, for example, only one-eighth of the jobs were located in central business districts in 2000 (Angel and Blei 2015)—but commuting to these jobs is difficult due to street layouts, which generally have an overabundance of radial roads to the city center and a shortage of suburb-to-suburb arterial links. Finally, the absence of an arterial road grid within walking distance of homes makes the provision of public transport less viable and the provision of trunk infrastructure more difficult, if not impossible. This problem is clearly illustrated in the city of Bangkok.

The hands-off, laissez-faire, market-led approach to urban development that has characterized Bangkok illustrates how the absence of arterial roads creates large losses in efficiency and stymies organized urban expansion. It underscores one of the drawbacks of this type of expansion, which ignores the substantial land needs for public works. Arterial roads are spaced no less than eight kilometers apart, and the local roads are not connected to one another to facilitate

through traffic. As longer intracity trips are crowded onto a small number of main roads, congestion increases, which results in more air pollution, heightened energy use, and decreased labor productivity.

The absence of an arterial road grid in Bangkok makes it very difficult to extend key infrastructure services. Indeed, most Bangkok districts do not have a piped water supply and must continue to rely on water pumped from increasingly deeper wells. Because well drilling leads to land subsidence, large areas of Bangkok are now below sea level. The absence of an arterial road network also makes it much more difficult for the city to collect its storm water and pump it out, or for it to collect its sewer water and treat it properly before pumping it out or recycling it. Indeed, Bangkok does not have piped drainage or sewer systems. Most modern homes are built on a meter or more of landfill (rather than on stilts as in the past) so as to stay above flood level. They are fitted with septic tanks that are too close together and rarely emptied, meaning that sewage simply seeps into the wet ground around it, polluting deeper and deeper levels of groundwater.

In short, for Bangkok, one of the world's largest and fastest-growing cities, the absence of adequate land for public works has been devastating. The city is expanding rapidly without an arterial road network; a primary infrastructure network that can carry water, sewage, or storm water; a system of dikes to manage its storm water; and a hierarchy of public open spaces large and small. As a result, it suffers from acute traffic congestion, air and water pollution, and flooding caused by land subsidence. It also has a dire lack of parks and playgrounds.

The solutions to its self-inflicted environmental crisis would require massive investments in public works. But in the absence of the rights-of-way for an arterial road network, investment in public works would be exorbitant and quite possibly unaffordable now or any time soon. Necessary as they may be, the solutions would require massive destruction of private property, which would make them nearly impossible to implement. Land for these public works should have been acquired or reserved before the city's expansion took place or, at the very least, at the time of the earlier phases of urban development and expansion. In fact, a 30-meter-wide arterial road grid, with roads spaced one kilometer apart, would have taken up only 6 percent of the land in areas of expansion had this land been purchased then.

STREETS

Prior to the transportation revolution that took place around 1800, all cities were walking cities. Passageways only a meter or so wide were needed to connect to private realms. In the old sectors of many cities, such as the casbah of Algiers, private property is still connected by narrow lanes (figure 3.2). This is also true of the contemporary high-density informal settlements of many cities, from Dharavi in Mumbai to Khlong Thoy in Bangkok and Rocinha in Rio de Janeiro. What is more, many of these networks are hierarchical and treelike, rather than gridlike. In a treelike structure of passageways, there is only one route connecting each

Figure 3.2
The Casbah of Algiers, 1938

Source: Map data from Google, DigitalGlobe (2015).

private realm to the rest, and the total length of the passageways is minimal. The route between any two realms can be quite circuitous. Some links in the network may be central and heavily used, while others may be peripheral dead ends that are rarely, if ever, used. As new private realms are added, each one is connected to the existing network with a narrow passageway, and the overall network continues to retain its hierarchical properties. This type of network is the earliest stage in the evolution of street networks. It has three important properties: its total length is minimized; its width, and therefore its total area, is minimized; and it can develop gradually through the atomistic actions of private individuals or groupings.

The second stage in the evolution of street networks is still hierarchical, but it provides for wider roads that can carry cars, passenger vans, small trucks, and emergency vehicles, though rarely buses. Roads must be around six meters wide in order to carry two-way traffic. They are often unpaved and rarely have sidewalks. This type of road network still minimizes total road length, but it does not minimize road width or total road area. Like the earlier network, it can be developed gradually through the atomistic actions of individuals. The road network of the section of Bangkok mentioned above is an example of this later stage of

street evolution. The roads there are typically six meters wide. The rights-of-way are negotiated by village headmen, who approach abutting property owners and ask them each to contribute a three-meter-wide right-of-way for a road into the interior of the area. Over time, they are able to construct zigzag-shaped roads into all private properties by way of these small, unplanned actions, each building on an earlier one. This road network is not on a grid. Many road segments are cul-de-sacs, and most intersections are three-way, rather than four-way, as in a typical grid. This type of network creates a hierarchy of plots in terms of their accessibility: some are at the far edge of a cul-de-sac and are less accessible than others that are located where many roads meet before joining a wider city street or avenue. All properties have access to one another, but the routes connecting them are quite circuitous. The advantage of this type of network over the earlier one is that it provides road access to plots and, more important, it provides road access for emergency vehicles.

The third stage in the evolution of street networks employs the street grid, which has been in existence for thousands of years. The best-known grids are rectangular, like those in the 1811 Commissioners' Plan for Manhattan, New York, or the 1898 plan for Buenos Aires, the capital of Argentina. At this stage, all the streets are wide enough to carry vehicular traffic, as well as pedestrian, bicycle, and bus traffic, and they often provide for on-street parking as well. Blocks are relatively small, and the great majority of intersections are four-way. As a result, there are many alternative routes from location to location. There is no hierarchy of road segments, as all roads are of equal importance. Adrian Gorelik, in his book *La Grilla y el Parque* (Gorelik 2010), equates the 1898 street grid in Buenos Aires—the grid shown in its 1904 plan as covering the entire city—with the homogenization of its territory in the spirit of social reform, removing any differentiation between rich and poor or formal and informal, and equalizing the distribution of public services, essentially streets and public open spaces. Street grids are less prone to congestion because there are many alternative routes from place to place and no particular street is a bottleneck, a typical limitation of hierarchical road networks. Street grids with short blocks are also more walkable than hierarchical networks, because people can walk in relatively straight paths to their destinations. At this stage, the overall length of streets, as well as their width, increases. As a result, a larger share of the land needs to be devoted to streets. The street network of Manhattan, New York, for example, takes up as much as 36 percent of its built-up area.

The key feature that differentiates this stage in the evolution of street networks from earlier ones is that it requires that streets be laid out over the entire area in advance of settlement and construction. Urban development can no longer be undertaken solely through the atomistic actions of individual landowners. Surely, an individual can subdivide his or her land into plots and organize the street pattern within the land as he or she sees fit or in accordance with the prevailing land subdivision regulations. But for a dense street grid to emerge,

Figure 3.3
The El Carmen Squatter Settlement in Comas, a Suburb of Lima, Peru

Source: Map data from Google, DigitalGlobe (2015).

planning control over a large area—sometimes the entire area of urban expansion—is of central importance.

Planning and securing this land requires organization. While Bangkok's suburbs were built up with little organization to speak of, the creation of new squatter settlements on the desert outskirts of Lima, the capital of Peru, required serious organization. The Comas district, for example, was formed by a series of organized "invasions" in the 1960s. Each invading family occupied one building site, which was surveyed and selected in advance. The sites were relatively large, measuring 10 by 20 meters. There were 20 sites to a block and 10-meter-wide roads between blocks (figure 3.3). Some blocks were intentionally left open for markets, schools, and public open spaces. Comas is now a fully built urban neighborhood, indistinguishable from any other neighborhood in the city. Squatters were eventually awarded titles to the land, and houses in the district are now part of Lima's formal housing market. In Comas, given its small blocks and wide streets, no less than 27 percent of the land area is devoted to local streets.

The advance planning and reservation of rights-of-way for street grids at the block level are essential for the orderly development of the urban periphery. It stands to reason that the Comas street grid and its open spaces accelerated its incorporation into metropolitan Lima as a district among equals. By making all plots similar to one another and facing a broad street, the Comas plan also reduced the difference in real estate values among houses in the community and increased the overall value of real estate in the metropolitan area as a whole. This important lesson has not been lost on others, and in several countries developers of minimally serviced, informal land subdivisions catering to the urban poor lay out streets and plots with an eye to creating neighborhoods that will be indistinguishable from higher-income ones (Baross and van der Linden 1990). The basic street grid, with its myriad variations at the neighborhood level, thus has an important social and economic value for neighborhood residents, and it is usually—but not always—in the interest of landowners, developers, and local people to cooperate in making it happen.

At one end of the spectrum, where informal developers subdivide land for sale to low-income families, street networks may still retain their hierarchical nature, and only a small share of land may be devoted to streets. At the other end of the spectrum, developers of upper-income communities may choose to insulate their projects from the rest of the city by creating walls around them, essentially privatizing all the "public" space within them by preventing strangers from passing through. In upper-income outer suburbs where large plots are accessible only by car and no one walks, a smaller share of the area may be devoted to streets, and a hierarchical system of streets, abounding with cul-de-sacs and three-way intersections, may be reintroduced (figure 3.4). In yet other neighborhoods on the urban periphery, large apartment-block projects may be accessible only to residents, with public areas separated from the rest of the city. These are only a few examples of street networks that do not fall neatly into the three stages of evolution outlined here. Some people may view them as either more or less advanced than other networks. That is a value judgment, however, and not pertinent to this discussion.

ASSESSING THE EVIDENCE

Assessing the current state of the evolution of street patterns in urban expansion areas throughout the world is an important step in understanding what can and should be done to improve them. Public officials, professionals, and interested citizens should have the ability and the information to judge the quality of their street networks so that they can then act together to guide the development of their cities in a manner that will promote the most beneficial growth. The attributes of street networks outlined earlier can serve as guidelines for understanding and analyzing urban street patterns.

Efficient, equitable, sustainable, and orderly urban expansion requires that an adequate amount of land on the urban fringe—where expansion is likely to take place—be allocated for streets before urban development takes place. A share

Figure 3.4
A Large-Lot, Car-Oriented Subdivision in Franklin Township, New Jersey

Source: Map data from Google (2015).

of that land, on the order of 5 percent, should consist of the rights-of-way for a grid of arterial roads—preferably spaced approximately one kilometer apart, or within walking distance of homes and workplaces—a grid that can carry public transport and trunk infrastructure as well as facilitate drainage. Another share of land should be reserved for streets, also preferably in advance of development. The requirements of this share will depend to a large extent on current norms and practices. Standards that can be expected to be met, let alone enforced, in one city cannot be simply transplanted to another.

There is disparate evidence on the share of land dedicated to streets in various cities. For a review, see UN-Habitat (2013). Two recent studies merit attention. The first reported on the decline in the share of land devoted to streets in U.S. cities (Peponis et al. 2007). It compared street density, measured in kilometers of streets per square kilometer, in urban districts developed before and after 1950 and found that the share of land declined significantly between the two periods. Using the data from this study, I determined with a 99 percent level of confidence that street density declined from 15.4 ± 1.6 km/km^2 to 8.6 ± 1.1 km/km^2 between the two periods. Assuming that streets did not vary greatly in width between the two periods, urban districts in U.S. metropolitan areas during the later period devoted significantly less area to streets than those in the earlier period.

The second study compared the share of land in streets in city cores and suburban areas in a representative set of cities worldwide (UN-Habitat 2013). Using the data for 52 cities in this study, I determined with a 99 percent level of confidence that the average area in streets in these cities was 19.7 ± 2.8 percent in core areas, compared with 8.6 ± 1.3 percent in suburban areas. Since core areas have higher residential densities than suburban ones, it is safe to assume that higher densities go hand in hand with a larger share of land devoted to streets. I also determined with a 99 percent level of confidence that cities in more-developed countries had a higher share of their land in streets in core areas than those in developing countries: 26.9 ± 3.8 percent versus 16.5 ± 2.7 percent. They also had a higher share of land in streets in suburban areas: 11.7 ± 1.8 percent versus 7.2 ± 1.3 percent. In other words, streets in peripheral areas of cities today occupy significantly less land than streets in more-central areas. And streets in cities in more-developed countries, which typically have lower residential densities than cities in developing countries, now occupy significantly more land than streets in cities in less-developed ones. These results are preliminary and may be unreliable. For example, there were issues of definition in the United Nations Human Settlements Programme study (UN-Habitat 2013) that reduced the reliability of estimates. To be estimated correctly, the share of land in streets must be its share of the built-up area of cities and not its share in the administrative area of cities, an area that may contain large amounts of vacant land. And street maps must be complete for data to be truly comparable. It is not clear that these conditions were met in all the cities studied. I revisited the data for 30 cities in this study with the aim of mapping one square kilometer in the city core and one square kilometer in the suburbs to illustrate the great variety of urban street patterns across the world.[2] The maps for these cities, arranged in alphabetical order, are shown in figure 3.5. They illustrate that, in general, the streets in the core area occupy a larger share of the total area than streets in the suburbs; they are also wider and intersect one another more frequently. In some cities, such as Bangui, Central African Republic, there are very few streets in the suburbs, as homes are built in a haphazard fashion, connected by meandering walkways.

The share of the land in streets in areas of recent urban expansion is only one dimension (though a central one) of the quality of expansion. More and better data are needed on this dimension for cities throughout the world and, more important, for their fringes, where urban expansion is taking place. Although more information about the *quantitative* aspects of global urban expansion is available now than ever before, much less information is available about the *qualitative* attributes, especially in regard to the patterns of streets. The proposed initiative outlined in the rest of this chapter aims to generate comparative data pertaining to these attributes in a representative global sample of cities.

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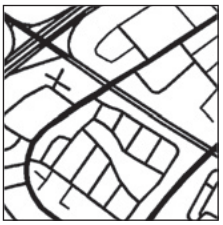
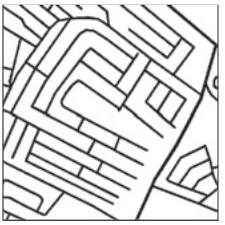
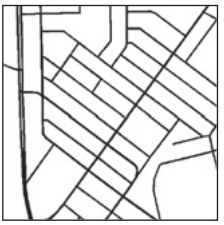
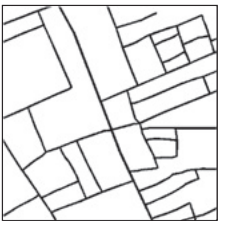
2. Manuel Madrid provided maps and calculations for these cities based on the maps and street categories at *www.openstreetmap.org*.

Figure 3.5
One-Square-Kilometer Street Maps in the Core and Suburban Areas of Selected Cities


Abuja core (25.3%)

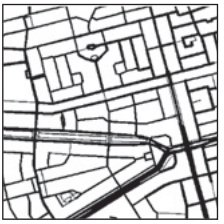

Abuja suburb (19.2%)


Accra core (14.7%)


Accra suburb (10.8%)


Addis Ababa core (19.8%)


Addis Ababa suburb (14.6%)

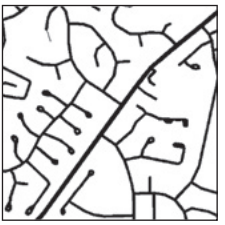

Amsterdam core (28.2%)


Amsterdam suburb (23.2%)

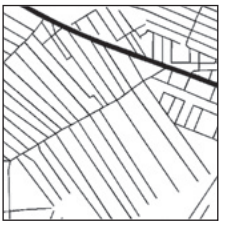

Athens core (25.8%)

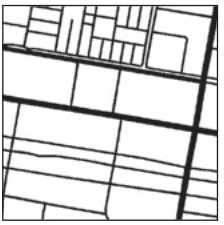

Athens suburb (23.8%)

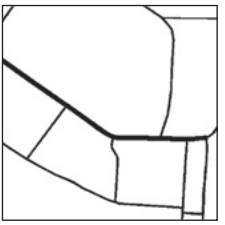

Auckland core (25.3%)

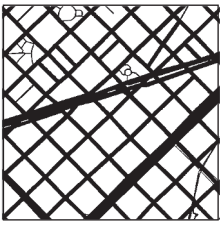

Auckland suburb (16.7%)


Bangkok core (23.2%)

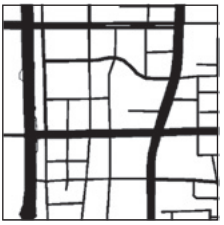

Bangkok suburb (13.5%)

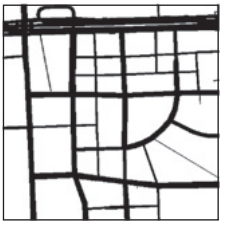

Bangui core (20.2%)


Bangui suburb (13.5%)


Barcelona core (36.4%)


Barcelona suburb (22.7%)

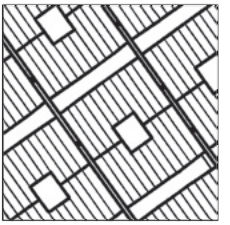

Beijing core (26.9%)

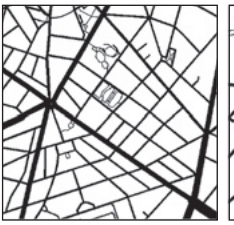

Beijing suburb (26.0%)

(continued)

Figure 3.5 *(continued)*


Brasilia core (35.3%)


Brasilia suburb (28.4%)


Brussels core (24.8%)


Brussels suburb (20.8%)


Chandigarh core (22.3%)


Chandigarh suburb (22.6%)


Copenhagen core (28.0%)

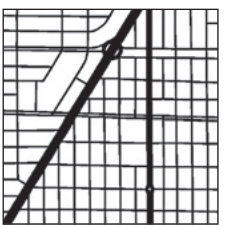

Copenhagen suburb (21.4%)


Dakar core (20.9%)


Dakar suburb (18.3%)


Georgetown core (18.4%)


Georgetown suburb (7.3%)


Guadalajara core (27.4%)

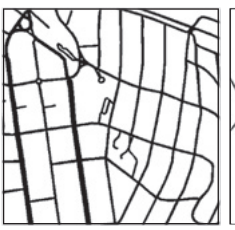

Guadalajara suburb (23.5%)


Helsinki core (31.6%)


Helsinki suburb (24.6%)


Hong Kong core (35.2%)


Hong Kong suburb (14.6%)


Kigali core (19.2%)

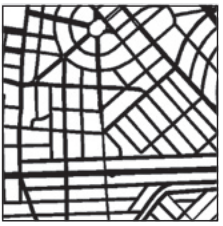

Kigali suburb (5.4%)

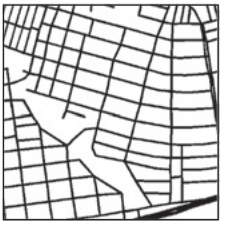
(continued)

Figure 3.5 *(continued)*

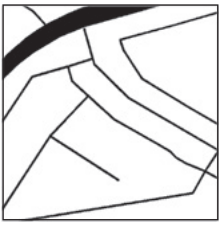

Kolkata core (17.9%)

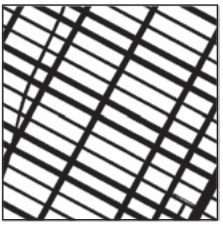

Kolkata suburb (16.4%)


Medellin core (37.2%)

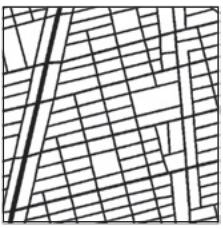

Medellin suburb (20.8%)

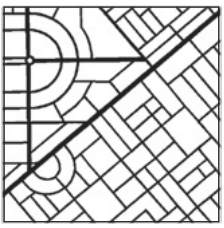

Nairobi core (15.2%)


Nairobi suburb (11.2%)

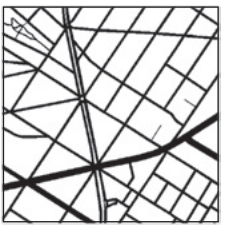

New York core (38.7%)


New York suburb (24.1%)


Ouagadougou core (25.9%)


Ouagadougou suburb (21.0%)


Paris core (33.5%)


Paris suburb (22.9%)

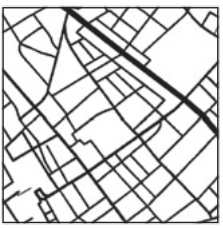

St. Petersburg core (29.3%)


St. Petersburg suburb (27.2%)


Singapore core (29.8%)


Singapore suburb (27.2%)


Tokyo core (29.1%)


Tokyo suburb (12.4%)


Yerevan core (13.0%)


Yerevan suburb (11.6%)

Monitoring Global Urban Expansion

There are currently no metrics for measuring the global performance of the world's cities, which are now home to more than half of the world's population. The United Nations Population Division publishes a biannual report called *World Urbanization Prospects*, which contains important information about global urbanization, including data on the past, present, and future urban population in every country, as well as in major urban agglomerations (UN Population Division 2011). This information, regularly improved and updated, is quite useful, but it does not address many of the issues that are most critical to monitoring the performance of cities on a global scale.

The United Nations monitors the state of the world and guides global development through its Millennium Development Goals. Other than the share of the urban population in slums, however, there is no goal that pertains to the performance of cities and no metric that could measure progress in the attainment of that goal if it should exist. The purpose of the initiative proposed here is to monitor global urban expansion and provide a set of metrics for measuring both the quantity of land converted to urban use and the quality of the resulting environment in areas of urban expansion. The key objective is to provide policy makers—in local governments, central governments, and international agencies—with a reality check in setting goals, preparing plans, and investing public resources in helping cities to accommodate their expected population growth in the coming decades.

The world's urban population is expected to double between 2010 and 2050, from 2.6 billion to 5.2 billion. The urban population of developed countries is expected to increase by a mere 160 million during this period and stabilize at 1 billion by 2050. By that time, the urban population of developing countries will have increased by 2.4 billion, or 15 times that of developed countries (Angel 2012). It has been shown that putting limits on city population growth is ineffective. Attempts to prevent people from migrating to cities or from moving from one city to another have utterly failed and are prohibited by the United Nations' Universal Declaration of Human Rights (UN 1948). But cities do occupy land, and the conversion of land to urban use is guided and influenced by public policies and actions.

As cities grow in population and wealth, they expand, and as they expand, they need to convert and prepare more land for urban use. Stated as a broad public policy goal, cities need *adequate land* to accommodate their growing populations, and this land must be *properly serviced* and yet *affordable* to be of optimum use to their inhabitants. Cities that can consistently meet this goal become more efficient, productive, equitable, sustainable, and resilient. To do so, however, they need concerted public action that must precede and guide the operation of the free market on the urban fringe. More particularly, in the absence of concerted public action that can secure adequate land for public works (arterial roads and streets, public utilities, public open spaces, and public facilities) *in*

advance of development, land and housing markets, efficient as they may be in theory, will fail to perform efficiently in practice.

The *Atlas of Urban Expansion* (Angel et al. 2012) contains systematic and comparable data on a number of metrics of key quantitative attributes of urban expansion (urban extent, built-up area density, fragmentation, and compactness, as well as the changes in them over time) in a global sample of 120 cities from 1990 to 2000. It offers the beginnings of a scientific understanding of the quantitative aspect of global urban expansion—namely, how much land will need to be converted to urban use, in the absence of revolutionary changes in current practices and norms, to accommodate the expected population growth in the coming decades. That being said, there is only anecdotal evidence available regarding the quality of global urban expansion.

The initiative outlined in this section would help cities the world over become proactive in making adequate preparations for expansion. Cities can be expected to expand whether advance preparations are made or not. Yet preparations can prevent disorderly urban expansion, which can result in problems that are difficult and costly to correct after cities are built and populated. Building an essential arterial road in a densely built-up area of Bangkok, for example, is now next to impossible. Upgrading basic infrastructure in some of the dense favelas in Brazil costs three to six times as much now as it would have in advance of their occupation (Abiko et al. 2007). In general, it is safe to conclude that not all urban expansion has the same quality and that some forms are clearly preferable to others.

UN-Habitat has formed a partnership with the Urbanization Project at the Stern School of Business of New York University to monitor global urban expansion in a new stratified sample of 200 cities (a 5 percent sample of the universe of 4,043 cities and metropolitan areas that had 100,000 people or more in 2010) in preparation for Habitat III, the United Nations Conference on Housing and Sustainable Urban Development, scheduled for the summer of 2016. The monitoring effort will be divided into three distinct phases.

In the first phase, the *Atlas of Urban Expansion: The 2015 Edition* will produce the same metrics as the previous *Atlas* for three years—1990, 2000, and 2010—for the new sample of cities, thus greatly improving understanding of the quantitative dimensions of global urban expansion. The 2015 edition of the *Atlas* is a joint project of UN-Habitat, the Lincoln Institute of Land Policy, and the NYU Stern Urbanization Project. Its focus, as before, is on the quantitative aspects of urban expansion.

The second and third phases of the monitoring initiative focus on the quality of the emerging urban fabric in expansion areas and are the subject of this section. The second phase involves the analysis of high-resolution satellite imagery of the expansion areas. The third phase involves engaging people on the ground in each city in the global sample. The second and third phases are now in the pilot stage. They are being tested in four cities: Addis Ababa and Mekele in Ethiopia, and Bogotá and Valledupar in Colombia. The analysis of satellite imagery in the

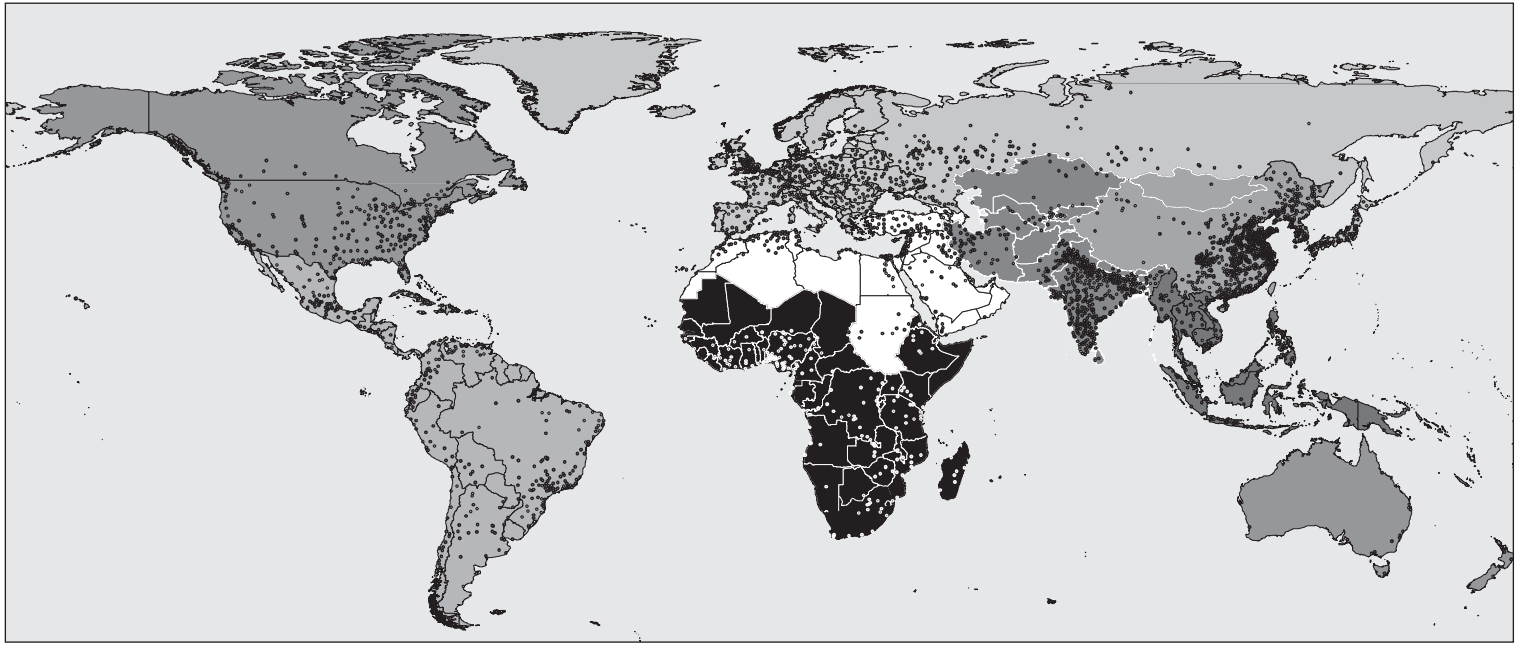
second phase focuses on the years 1990–2000 and 2000–2013. Maps prepared from medium-resolution satellite imagery in phase 1 are used to identify these expansion areas in images from two open-source collections of high-resolution satellite imagery, Google Earth and OpenStreetMap. The maps are then analyzed with the purpose of obtaining a set of metrics that can address different quality attributes directly from the high-resolution satellite images. Data on additional attributes and metrics that cannot be directly observed in the satellite imagery will be collected on the ground in phase 3. The purpose of the rest of this chapter is to articulate these attributes and to propose simple metrics that can measure them in a consistent and rigorous manner.

THE NEW GLOBAL SAMPLE OF CITIES

The new global sample of cities is described in detail in an unpublished research note (Angel et al. 2014) and is summarized here. Using a number of data sources, my colleagues and I identified a universe of 4,043 cities, metropolitan areas, or urban agglomerations that had at least 100,000 people in 2010 (figure 3.6). The only data currently available on the cities in this universe are their names, their populations at one or more recent points in time, and their geographic coordinates. The unit of analysis is the urban agglomeration, here referred to by the more general term *city* or *large city* to denote a city with 100,000 people or more. This unit of analysis is a contiguous built-up area extending out of a traditional city center that can be identified on a map, associated with a name, and given map coordinates. Thus, there is only one name associated with each city, even though it may comprise a large number of municipalities. For example, Tokyo, an urban agglomeration that had 36.7 million people in 2010, is considered to be one city with a single name. For each city in this universe, we obtained population data for the latest two census periods, one circa 2000 and one circa 2010. The population data are associated only with the city name. In general, maps of the enumeration areas corresponding to those numbers are not readily available. The total population in this universe comprised some 70 percent of the total world urban population in 2010. The remaining 30 percent was in a very large number of cities and towns with populations below 100,000.

It is not necessary to study the entire universe of cities in order to monitor global urban expansion. A carefully designed sample of cities can be studied instead. Using appropriate statistical tools, the results from the sample can then be generalized to provide insights into the patterns and characteristics of urban expansion in the entire universe of cities. We selected a stratified sample of 200 cities with a view to drawing useful conclusions about the universe. There are three strata: eight world regions, four city population size categories, and three groups of countries with different numbers of cities. In general, the sample was drawn with the urban population in mind, focusing on urban dwellers rather than on cities. For example, the number of cities sampled in each world region is roughly proportional to the urban population in that region; the number of cities in each population size category is roughly proportional to the total population

Figure 3.6
The Universe of 4,043 Cities with 100,000 People or More in Eight World Regions, 2010



Source: City location data from Angel et al. (2012 online).

in each category; and the number of cities sampled in each of the three groups of countries with different numbers of cities is proportional to the number of people in each group. Figure 3.7 is a map of the sampled cities.

The only data on the universe of cities not used in the construction of the sample were the annual population growth rates between the two census dates. The growth rates were used to test the representativeness of the sample. It was found that when cities in the sample were weighted by the number of cities in the universe they represent, or by the urban population in the universe they represent, the average population growth rates in the universe and the sample were not statistically different from each other at the 95 percent confidence level. Thus, the sample is indeed representative of the universe of cities.

QUANTITATIVE ATTRIBUTES OF URBAN EXPANSION OBTAINED FROM MEDIUM-RESOLUTION SATELLITE IMAGERY

The quantitative attributes of urban expansion are defined and described in detail in the *Atlas of Urban Expansion* (Angel et al. 2012), and the findings concerning these attributes are analyzed in detail in *Planet of Cities* (Angel 2012). They are reviewed here only for the purpose of presenting the monitoring initiative in its complete form.

Urban Extent Urban extent is the shape of the built-up area a city occupies in geographic space at a given point in time. The map describing that shape is the result of the classification of Landsat satellite imagery with a pixel resolution of 30 by 30 meters into three classes: (1) built-up; (2) not built-up; and (3) water. The measure of interest in characterizing urban extent is the total *built-up area* of the city. The built-up area is measured at different points in time, as shown in figure 3.8, so that its growth rate can be estimated and it can be projected realistically into the future. Maps of urban extent will be drawn and the built-up areas will be calculated for all 200 cities in the new global sample for three years, 1990, 2000, and 2013.

City Population The population of a city or metropolitan area is not well defined unless it is associated with a specific administrative district whose geographic boundaries are known. Administrative districts of cities do not necessarily correspond to their built-up areas. Sometimes they encompass only part of the built-up area, and sometimes they are much larger than the built-up area. For example, the administrative area of Beijing was 11 times its built-up area in 1999 (figure 3.9). For the study of urban expansion, it is of critical importance to obtain population data at a given point in time for all the administrative districts that together encompass and contain the built-up area of the city at that time but exclude, to the extent possible, built-up areas that are not part of the city. These data have only recently become available in digital form from national census bureaus, and they are often proprietary. The measure of interest in

Figure 3.7
The Sample of 200 Cities in Eight World Regions

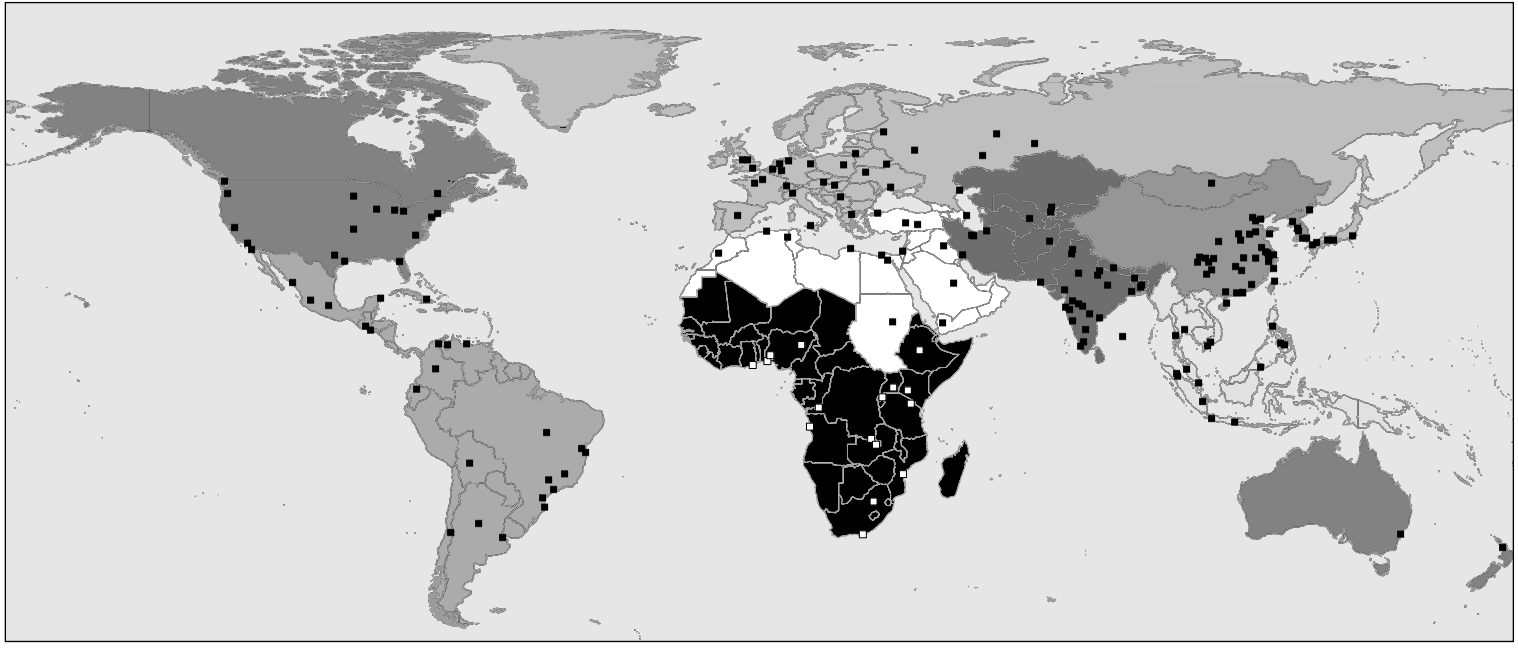
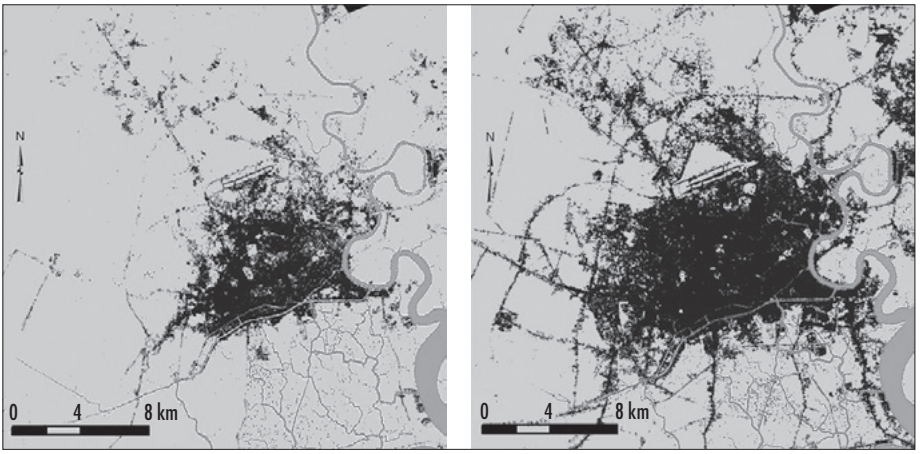
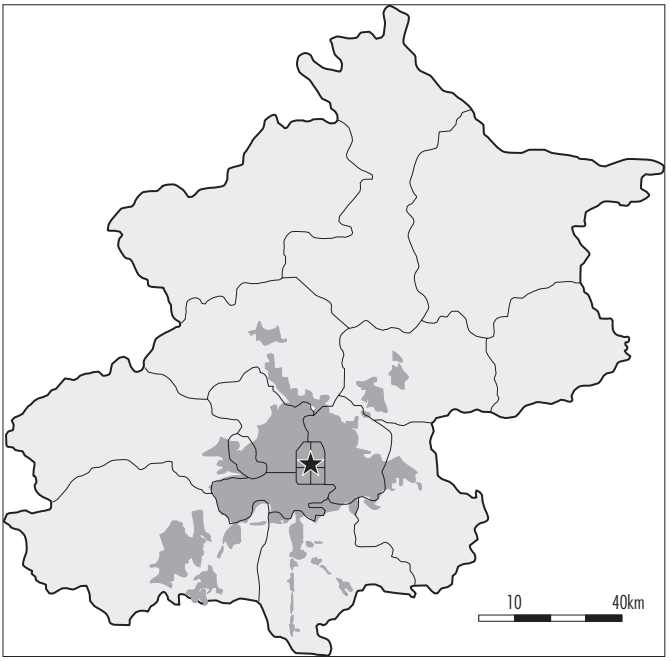


Figure 3.8
The Urban Extent of Ho Chi Minh City, Vietnam, 1989–1999



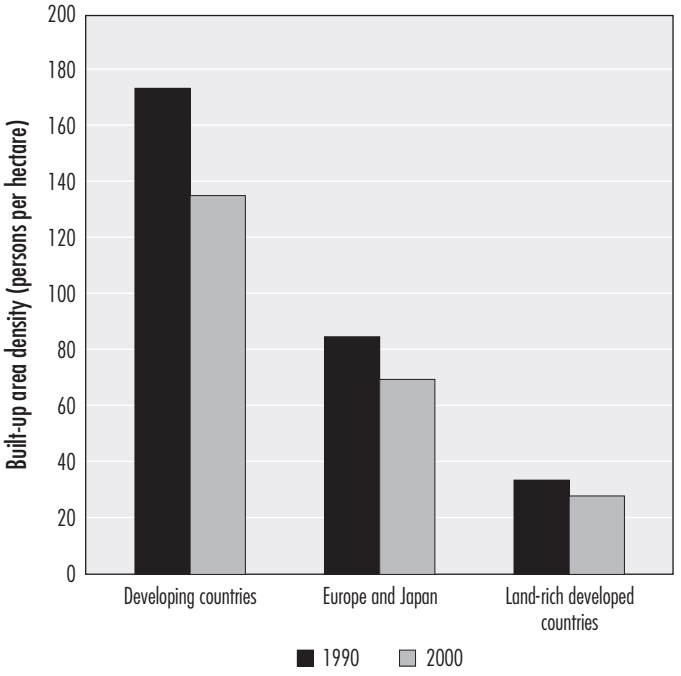
Source: Redrawn from Angel et al. (2012, 92).

Figure 3.9
The Administrative Area of Beijing, 1999



Source: Built-up area adapted from Angel et al. (2012, 48).

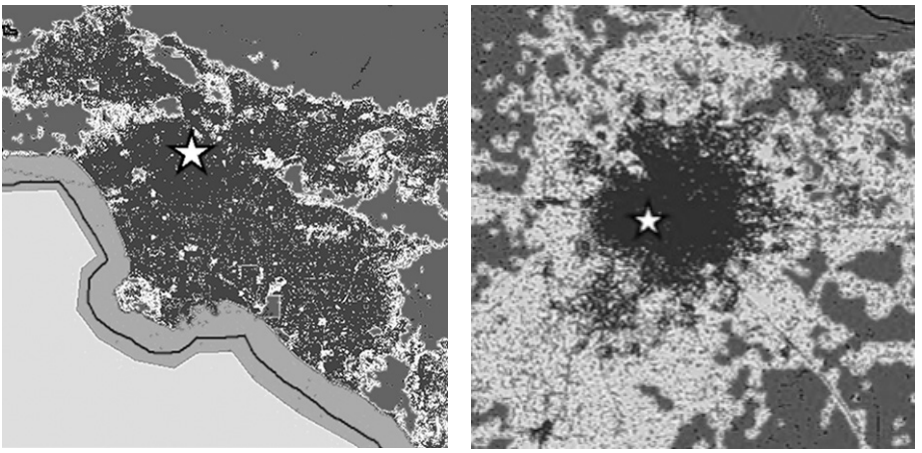
Figure 3.10
Average Built-Up Area Densities, 1990 and 2000



characterizing population is the total *city population* residing within these administrative districts at different points in time, so that its growth rate can be estimated and it can be projected realistically into the future. Maps of administrative districts and their corresponding populations will be obtained and drawn for all 200 cities in the new global sample for three years, 1990, 2000, and 2010.

Density The average density of the built-up area of a city—that is, its total population divided by its total built-up area—is the measure of interest in calculating the area that a city will occupy when its population reaches a given size. The average *built-up area density* of the city can be calculated at different points in time so that its growth rate can be estimated and then projected realistically into the future. Values for the average built-up area density will be calculated for all 200 cities in the new global sample for three years, 1990, 2000, and 2010. In a sample of 120 cities, variations in average built-up area density ranged from 550 persons per hectare in Hong Kong to 20 persons per hectare in Minneapolis. On average, densities in the sample declined in all world regions at an average rate of 2 percent per year between 1990 and 2000 (figure 3.10).

Figure 3.11
Urbanized Open Space (light gray) in Los Angeles, 2001 (left), and Zhengzhou, China, 2000 (right)



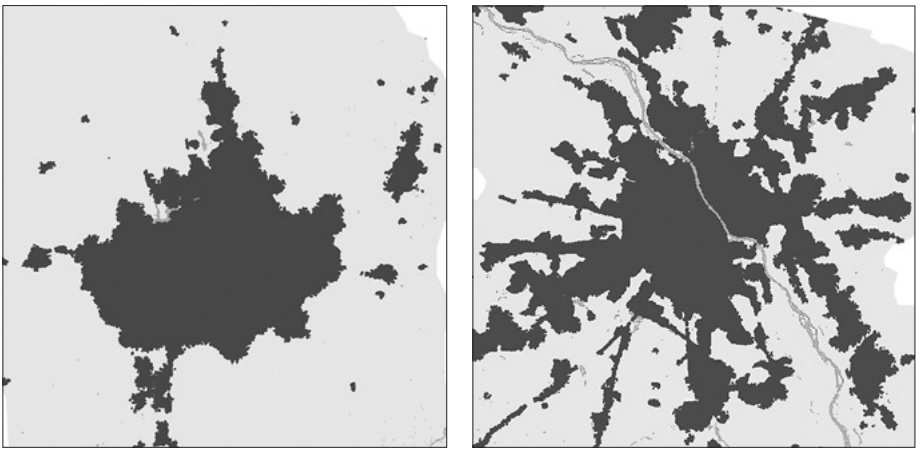
Source: Angel et al. (2012, 138; 252).

Fragmentation Urban extent underestimates the total amount of land a city occupies because it ignores the open spaces in and around the built-up areas. Open spaces fragment the built-up areas of cities, and built-up areas fragment the open spaces in and around them. The degree of fragmentation can be measured with the *city footprint ratio*, which is equal to the sum of the total built-up area plus the total area of urbanized open space, divided by the total built-up area. On average, this ratio was about 2.0 in a global sample of 120 cities in 2000. In other words, cities occupied areas that were, on average, twice as large as their built-up areas. The city footprint ratio varied from 1.4 in Los Angeles to 2.8 in Zhengzhou, China (figure 3.11).

Compactness The degree to which the city footprint approximates a circle at different points in time can be measured and projected realistically into the future. The metric of interest is the *cohesion index*, which is equal to the average distance between random points in a circle with the same area as that of the city footprint, divided by the average distance between random points in the city footprint at different points in time. Ibadan, Nigeria, for example, had a higher cohesion index than Warsaw, Poland, in 2000 (figure 3.12).

These five attributes of urban expansion are useful in understanding how much land has been converted to urban use in recent years in different cities, offering some indication of how much land will be converted in the coming decades, bar-

Figure 3.12
The City Footprints of Ibadan, Nigeria (left), and Warsaw, Poland (right), 2000



Source: City footprint maps redrawn from Angel et al. (2012, 100; 242).

ring a radical change in the urbanization patterns that have been in place for a century or more. But these attributes provide little information about the *quality* of urban expansion. We do not know, for example, whether arterial roads, local streets, or public open spaces in expansion areas are in adequate supply; whether expansion areas are squatted on or occupied before they are laid out properly in proper land subdivisions; whether homes in expansion areas have a full complement of basic services, such as piped water and sewage; whether expansion areas are accessible to jobs; or whether land and housing in expansion areas are affordable. Without this evidence, which can establish a relationship between public action in advance of urban expansion and the quality of the built environment in expansion areas, urban policy makers will continue to act without an empirical basis for their decisions.

QUALITATIVE ATTRIBUTES OF URBAN EXPANSION OBTAINED FROM HIGH-RESOLUTION SATELLITE IMAGERY

Current knowledge of the qualitative attributes of present-day urban expansion in different cities in different countries is meager and unsatisfactory. At best, it is anecdotal and unsystematic. Where more-rigorous studies have been carried out, they have usually focused on cities in developed countries, particularly those in the United States, where the sheer quantity of urban expansion and suburbanization in recent decades has typically been characterized by the derogatory term *sprawl*, implying that it is to be lamented and should be resisted, contained, tamed, guided, and regulated. That being said, many cities in developing

countries that are growing rapidly in population, especially those in countries experiencing rapid economic growth as well, are also expanding rapidly in area and can be expected to expand manyfold in the coming decades. *Sprawl*, however defined, may or may not be an apt term for characterizing their expansion, because by and large, nothing is really known about the quality attributes of this expansion.

It is imperative that planners gain some understanding of whether such expansion is orderly or disorderly, whether it is accompanied by the full complement of public works, whether residential land supply in expansion areas is adequate or constricted, and whether housing in expansion areas is decent and affordable, to cite a few examples. If expansion is of sufficient quality, planners need not be especially concerned about it. But if it is not, there may be effective ways to improve it. The purpose of monitoring the quality of urban expansion is to gain an initial understanding, in a rigorous and systematic manner, of its quality attributes, of variations in these attributes among cities, of the reasons for such variations, and of effective, pragmatic, and realistic ways to address poor-quality expansion.

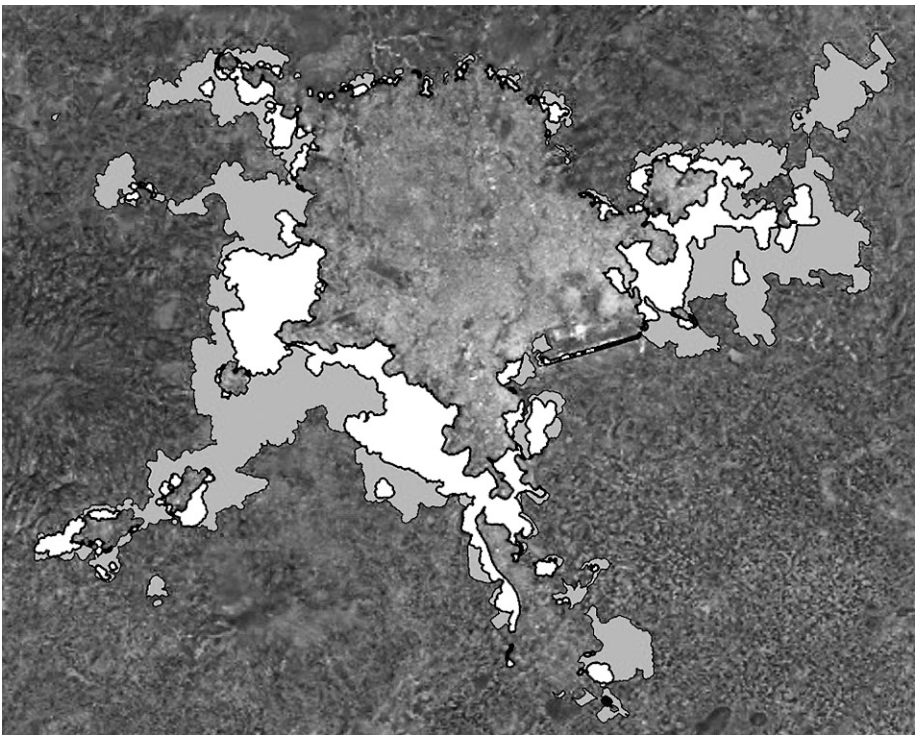
The challenge of studying the quality of global urban expansion is in the identification, assembly, analysis, and interpretation of available data and, more specifically, in reducing the vast quantities of data to a set of simple metrics that can usefully represent them. Such metrics may then allow for monitoring of global urban expansion over time, as well as for the comparative analysis and statistical modeling of that expansion—its attributes, causes, and consequences—in cities and regions.

Global high-resolution satellite imagery is now publicly available at no cost on Google Earth and OpenStreetMap, and it can yield important information on the qualitative dimensions of urban expansion—information that can later be supplemented by informants on the ground who can collect representative data. This satellite imagery is the focus of phase 2 of the proposed monitoring initiative. My colleagues and I, as well as our colleagues at the UN Human Settlements Programme (UN-Habitat) who are partners in this research, have chosen to study the expansion areas of cities first, before expanding the effort to cities as a whole. While there are clear advantages of studying expansion areas side by side with cities as a whole, this approach does increase the demand for data collection. In addition, we believe that the areas most recently settled are the least understood, often remaining invisible for most people, including scholars, who are more familiar with central cities and rarely venture out to the fringes.

In our pilot study of four cities—Addis Ababa and Mekele in Ethiopia, and Bogotá and Valledupar in Colombia—we divided the expansion into two periods, circa 1990 to circa 2000 and circa 2000 to circa 2013. The two expansion areas in Addis Ababa are shown in figure 3.13.

Between 1985 and 2000, the city expanded by 6,676 hectares (67 km^2), and between 2000 and 2010 it expanded by 10,892 hectares (109 km^2). These ar-

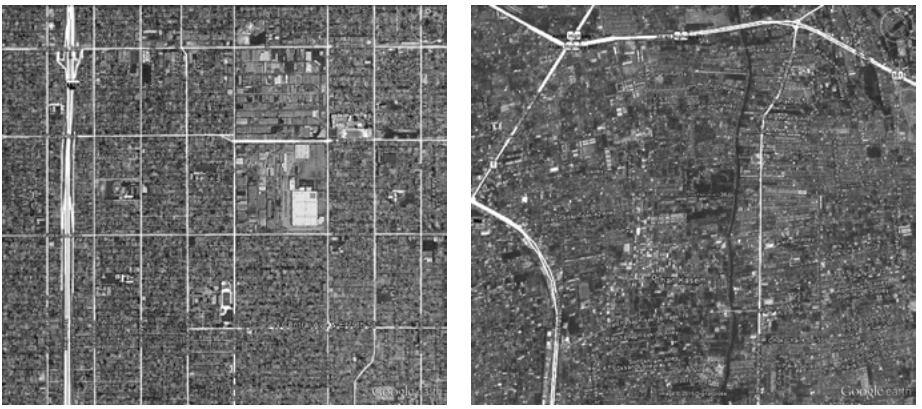
Figure 3.13
The Expansion Areas of Addis Ababa, 1985–2000 (light gray) and 2000–2010 (darker gray)



eas are still quite large and difficult to study in detail. We have, therefore, decided to study a representative sample of locales within the expansion areas, each 10 hectares in size. The statistical platform for selecting these locales and preparing them for analysis has now been finalized and is not described here. The number of locales to be analyzed in each city will depend on the variance in the city's development patterns. In cities with uniform patterns of development, only a few locales will be studied; in cities with diverse and varied development patterns, more locales will be analyzed.

Numerous aspects of the quality of urban expansion can be identified by analyzing high-resolution satellite imagery. In the pilot study of four cities, we chose to focus on five of them in a primary module for data collection: arterial roads, housing sector evolution, street space, block size, and rooftop density.

Figure 3.14
Arterial Roads in Los Angeles (left) and Bangkok (right)



Cities are shown at the same scale.
Source: Map data from Google, DigitalGlobe (2015).

Arterial Roads The arterial road grid pertains only to the network of *major arterial roads*, the urban roads that typically carry intracity traffic, public transport, and trunk infrastructure, especially water and sewer lines. It does not pertain either to the primary network of freeways that may connect cities to one another or to the tertiary network of local streets that provide access to individual properties. To accommodate and support efficient, equitable, and sustainable urban expansion, an arterial road grid on the urban fringe should have four essential properties: (1) it must cover the entire area designated for expansion and not just a segment of that area; (2) it must be a network of long, continuous roads that crisscross the expansion area and are connected to the existing road network; (3) the roads should be spaced no more than one kilometer apart to ensure that public transportation is within a 10-minute walk; and (4) the width of the roads should be 25–30 meters, so that they can include designated bus lanes, bike paths, a median, and several lanes to carry intracity traffic, but still not be too wide for pedestrians to cross safely and comfortably. Los Angeles, for example, has a relatively dense grid of arterial roads (figure 3.14, left). In contrast, large areas in suburban Bangkok have no arterial roads at all (figure 3.14, right).

An arterial road grid takes up a very small share of the built-up area. Thirty-meter-wide roads spaced one kilometer apart will take up only 6 percent of the land. It is, therefore, impossible to expect that the share of the land dedicated to arterial roads can be identified by inspecting a small sample of locales. In the proposed study, we will seek to identify arterial roads—wide roads that are

identified as major roads in OpenStreetMap—in the entire expansion area. We will then determine their width and calculate (1) the share of the expansion area in arterial roads and (2) the density of arterial roads, measured in kilometers per square kilometer of built-up area. As noted earlier, an efficient arterial road grid with 25–30-meter-wide roads will require 5–6 percent of the land and provide two kilometers of arterial road per square kilometer of built-up area.

Housing Sector Evolution The evolution of the housing sector on the urban fringe can be characterized by its level of organization—that is, the degree to which houses are located and built in an integrated and coordinated fashion. At one end of the spectrum, houses are located and built one by one over time in a haphazard but organic process through the atomistic actions of individual households. The orientation of the house and its distance from those built before it are determined by the household, with minimal attention paid to the efficient organization of public space, access roads, and residential infrastructure, such as water, sewer, and drainage lines. At the other end of the spectrum, complete projects with houses or apartment buildings of similar design are built to completion during a short period in large, legally approved subdivisions located on land that is assembled, planned, financed, and provided with a full complement of residential infrastructure and services before it is occupied (figure 3.15).

There is no question that public intervention aimed at improving the quality of urban expansion differs markedly depending on the stage in the evolution of the housing sector. At the present time, there is no information available on a global scale about the proportion of each type of residential environment. Some researchers assume that the bulk of the housing is either haphazard or arranged informally in so-called slums, but there is no solid basis for making such claims. One of the primary aims of the monitoring effort will be to assess the share of new development on the urban fringe that is indeed informal.

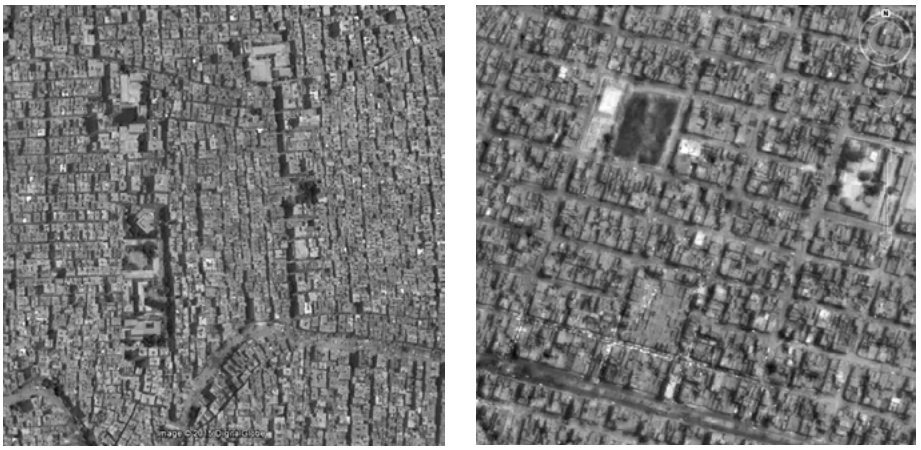
The stage in the evolution of the housing sector will be determined by first dividing the land in each selected 10-hectare locale in the expansion area into three discrete and nonoverlapping land use zones (each extending to the middle of roads or paths separating them): (1) residential; (2) nonresidential; and (3) open or vacant space. The residential zone within the locale will then be classified into four housing types based on the level of evolution, where *evolution* refers to the degree of planning, the availability of construction and mortgage finance, and the quality of public services: (1) informal settlements (irregularly shaped and irregularly arranged houses along meandering narrow paths); (2) informal land subdivisions (irregularly shaped houses arranged along narrow roads that were laid out in advance of occupation); (3) formal land subdivisions (proper street layouts and paved roads with a single house on each plot; (4) housing projects (similar or identical houses or apartment complexes in formal land subdivisions). The share of the residential land in the expansion area in each of these four residential categories will then be determined.

Figure 3.15
Building Without Prior Land Subdivision in Bangui, Central African Republic (top left); Informal Subdivisions in Accra, Ghana (top right); Formal Land Subdivision in Mexico City (bottom left); and Formal Land Subdivision with Identical Housing Designs in Ahmedabad, India (bottom right)

Source: Map data from Google, DigitalGlobe (2015).

Street Space Well-functioning urban neighborhoods require a substantial amount of area for streets. At the minimum, buildings have to be within a short distance (not more than, say, 50 meters) from fire lanes—streets that are wide enough to accommodate firefighting vehicles (at least three meters wide). Streets are also needed for vehicular traffic, to park cars, to walk or cycle, and to allow all residents and visitors to the city to share a common public realm. Municipal

Figure 3.16
Street Space in an Informal Settlement in Cairo, Egypt (left), and in a Squatter Settlement in Comas, a Suburb of Lima, Peru (right)



Note: Cities are shown at the same scale.
Source: Map data from Google, DigitalGlobe (2015).

street grids, to paraphrase Adrian Gorelik (2003), also function to homogenize the area of expansion, eliminating the differences between the formal and informal and the legal and illegal. Finally, a regular pattern of streets is needed to facilitate the provision of public works, especially water, sewer, and drainage lines. It has been reported that the cost of providing the full range of public works in informal settlements after they have been built ranges from three to six times that of providing them earlier, before residential areas are occupied (Abiko et al. 2007).

The share of the land in public streets is thus an important dimension of the quality of areas of urban expansion. That being said, it is often the result of the interplay of market forces rather than the successful application of local regulations. In the informal residential areas expanding into the high-value agricultural land on the periphery of Cairo, Egypt (figure 3.16, left), street space is meager, while in the informal residential areas formed by organized squatter invasions on low-value unoccupied land on the desert fringe of Lima, Peru (figure 3.16, right), street space is in ample supply. The monitoring initiative will seek to calculate (1) the share of the land devoted to streets in each of the four residential zones defined earlier and (2) the average width of the streets in each of these zones. These values will be used to determine the overall average share of the land devoted to streets in expansion areas, as well as the average width of streets.

Figure 3.17
Block Size in Beijing (left) and Manhattan (right)

Note: Cities are shown at the same scale.
Source: Map data from Google, DigitalGlobe (2015).

Block Size Streets are made for walking, and urban areas function best when people can walk freely from one place to another. Walking is facilitated when city blocks are short, when there are few cul-de-sacs, and when pedestrians are not blocked from entering restricted areas such as gated communities or large institutional grounds. It is quite evident, for example, that the streets in suburban Beijing (figure 3.17, left) are less accommodating of pedestrians than the short blocks of Manhattan (figure 3.17, right). The monitoring initiative will seek to measure the average area of blocks, and by measuring the density of street intersections—that is, the number of intersections per square kilometer in the expansion area.

Plot Area Regulations mandating a minimum area for residential plots, such as the large plot zoning requirements of many suburban municipalities in the United States (figure 3.18, left), function to exclude the poor from living in suburban locations that may provide them with better access to jobs and schools. Alternatively, when regulations that do not permit the provision of affordable plots can be ignored, the informal market will provide plots that are smaller and thus more affordable. In a way, the informal market may be sending a message to regulators that plot sizes may be too large, given what people can afford. At the same time, when residential plots are found to be exceedingly small (figure 3.18, right), the informal market may be signaling that residential land is in short supply and that the city cannot expand at a rate that might allow the

Figure 3.18
Large Plots in Franklin Township, New Jersey (left), and Small Plots in the Matinha Favela in Rio de Janeiro (right)

Sources: Image courtesy of Anton Nelessen (left); image courtesy of Alvaro Uribe (right).

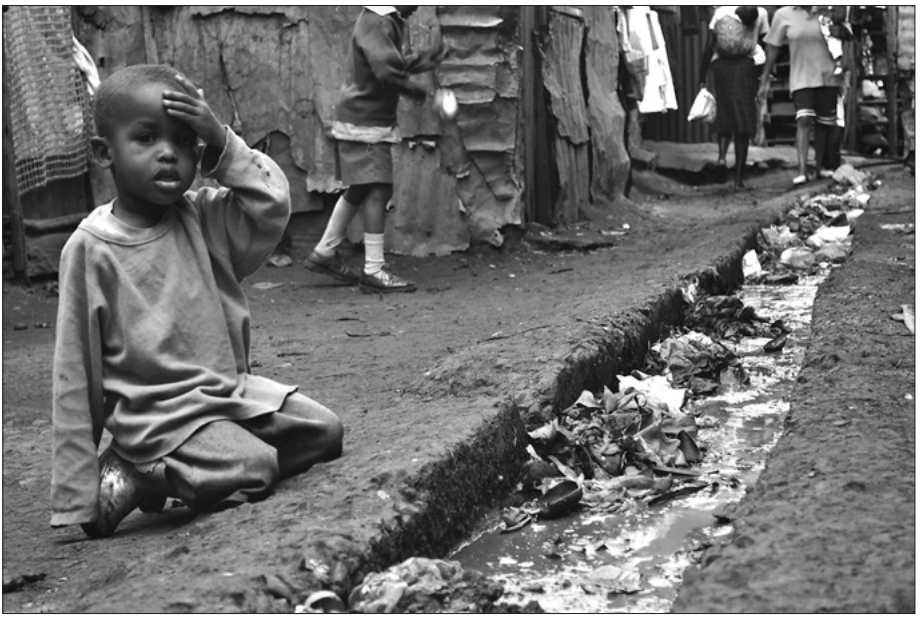
provision of plots of adequate size. The monitoring initiative will seek to measure the average size of plots in residential subdivisions with the aim of providing these signals both to regulators and to the formal residential land market.

It is clear that these five metrics are not independent of one another. More-advanced stages in housing sector evolution may require larger shares of land for streets. Similarly, larger plots and lower rooftop densities may require smaller shares of land for streets. Thus, the five metrics taken together provide both a description of the quality of the built environment in areas of expansion and a deeper understanding of the possible causal relationships among them. Data on these metrics applied to a global sample of cities will allow the estimation of global and regional norms, as well as provide more-robust explanations of commonalities and differences in norms among various cities and regions.

QUALITATIVE ATTRIBUTES OF URBAN EXPANSION OBTAINED FROM INFORMANTS ON THE GROUND

As noted earlier, the monitoring initiative will focus on urban areas of expansion in two time periods, circa 1990 to circa 2000 and circa 2000 to circa 2010. In each area of expansion, a set of 10-hectare locales will be examined. The number of locales in each area of expansion will depend on the overall variance in the city's metrics. It may be on the order of 20 locales in each area of expansion, or

Figure 3.19
An Open Sewer in the Kibera Slum of Nairobi



Source: © Trocaire/Creative Commons.

40 locales per city. In each city, informants who can visit each of the locales will need to be recruited to collect data from local residents, using a short questionnaire. The number of households interviewed may vary but should be about 10 households per subarea. In addition, informants may need to obtain information from local planning officials or from local real estate agents or other people familiar with the value of land and housing in the area.

The study of the quality of global urban expansion on the ground will focus on five key attributes: basic services, affordable plots and homes, squatters, access to jobs, and public open space.

Basic Services When cities are expanding rapidly, essential public services such as water supply and sewers may lag behind, leading to the imposition of high costs for the provision of such essentials or to the creation of neighborhoods with unsanitary living conditions (figure 3.19). The monitoring initiative will seek to determine the share of homes in expansion areas where water and sewers are in adequate supply. Informants on the ground will survey households in selected locales to determine the share of homes with a regular piped water supply and a functioning piped sewer system.

Figure 3.20
Squatter Settlements in Cape Town, South Africa (left), and Davao City, Philippines (right)

Sources: © Patrick Neckman/Creative Commons (left); © Carrie Kellenberger/Creative Commons (right).

Affordable Plots and Homes Expansion areas may be well supplied with a full complement of services and an adequate share of land in streets and arterial roads, but the plots and houses there may be out of reach financially for a substantial share of the households seeking shelter in the city. In cities where land with good access to the job market is in short supply—either because of artificial limits imposed on expansion or because of the absence of adequate access roads into the city—plots and homes on the fringe may no longer be affordable, for rent or for purchase, by those on the lowest rung of the city's income distribution. In other cities, however, plots and dwelling units on the urban fringe are highly affordable. The monitoring initiative will seek to determine the affordability of plots and homes in each expansion area, a key dimension of the quality of urban expansion. This may be done by surveying households in locales and inquiring as to the value of their homes or the rent they pay compared with their monthly household income. It may also be done by obtaining data from local real estate agents on the cheapest plots available for sale in the expansion area. After obtaining information on the median household income in the city, we will seek to calculate the ratio of the plot price to median income of the cheapest plots available in substantial quantities, the ratio of the dwelling unit price to income of the cheapest new dwelling units available in substantial quantities, and the ratio of rent to median income of the cheapest new dwelling units available in substantial quantities.

Squatters Much of the literature on housing in cities in developing countries still refers to squatter settlements as a major form of housing for the urban poor who are excluded from the land market (figure 3.20). But it is not at all clear

Figure 3.21
Singapore Mass Rapid Transit (left) and Jeepney Informal Transport in the Philippines (right)

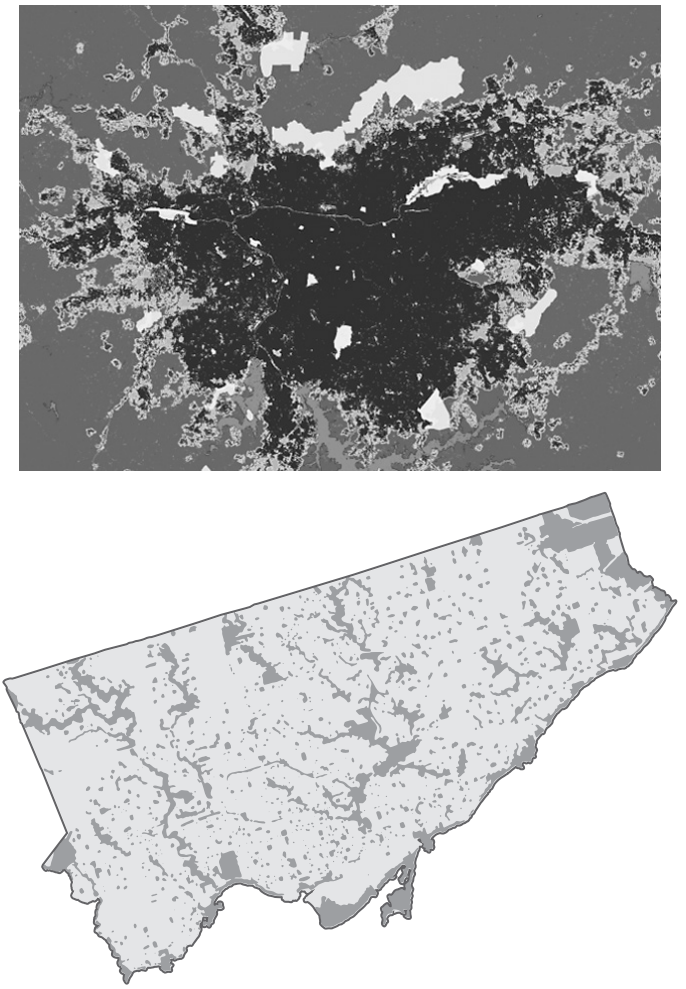
Sources: © Alantankenghoe/Creative Commons (left); © Ken Marshall/Creative Commons (right).

to what extent squatting remains a prevalent form of housing on the urban fringe and whether it is on the increase or the decrease. It is, therefore, not clear to what extent public action on housing the poor needs to address the squatter problem. The monitoring initiative will seek to determine the share of informal settlements in expansion areas that are squatter settlements by interviewing households in those areas.

Access to Jobs In some cases, areas on the urban fringe may be provided with a full complement of services and plots that are affordable to all. Yet these areas may be so far away from the central business district or from the metropolitan job market as a whole that getting to work may be too costly and time-consuming, reducing the benefit of living in a decent home located in a good residential neighborhood. It is important to know, therefore, how accessible expansion areas are to jobs and, more specifically, how accessible they are to jobs via public transport (figure 3.21). The monitoring initiative will seek to determine to what extent expansion areas are accessible to the metropolitan job market by public transport—be it formal or informal—by surveying selected households in locales as to (1) the longest time it takes any member of the household to get to work by any means of transport as well as by public transport and (2) the estimated time it takes to reach the central business district using public transport.

Public Open Space Public open space—parks, playgrounds, sports fields, and plazas—is an essential feature of well-endowed urban neighborhoods. But when development on the urban fringe is entirely at the mercy of market forces, very little, if any, open space is left for public use (figure 3.22, top). In cities with generous provisions of public open space, such as Toronto (figure 3.22, bottom),

Figure 3.22
The Absence of Public Parks in São Paulo (top) and the Public Park System in Toronto (bottom)



as much as 11 percent of the land is devoted to this purpose. The monitoring initiative will seek to determine (1) the share of the land in expansion areas in use as public open space; and (2) the average distance of homes from any such space. Both will be determined by household interviews in locales of the expansion areas.

Conclusions

While planners are beginning to acquire a good understanding of the amount of land required by cities to accommodate their burgeoning populations and of the rate at which cities the world over are now expanding, they know next to nothing about the qualitative attributes of urban expansion—namely, whether cities are expanding in a satisfactory manner or, alternatively, whether planners need to intervene to render it more satisfactory. And while we cannot and do not advocate a global set of standards, we do believe it is important to determine the present global and regional norms regarding urban expansion. Measuring these norms on a global scale may provide planners with the information they need to meet the challenge of managing future urban expansion in a more realistic and pragmatic way.

This chapter proposes a possible platform for undertaking this effort in the coming years that will focus on the expansion areas of a representative global sample of 200 cities during two time periods (circa 1990 to circa 2000 and circa 2000 to circa 2010). The monitoring initiative will entail analyzing high-resolution satellite imagery of a representative set of small locales within the expansion areas; administering a simple questionnaire to a small number of households in each subarea; obtaining information from experts on the regulatory environment and the real estate regime in the areas; assembling this global data set using a rigorous and consistent platform; using these data to obtain a set of comparable metrics for all cities in the sample; analyzing these metrics to obtain a set of global and regional norms of contemporary urban expansion practices and outcomes; and proposing a set of pragmatic and evidence-based action programs that can assist cities in improving their ability to accommodate their burgeoning populations in the decades to come.

Financing is already in place, and work on the first phase of the initiative, the *Atlas of Urban Expansion: The 2015 Edition*, is expected to be completed in the summer of 2015. Work on testing the primary and secondary modules of phases 1 and 2 is now in its initial stages and should be completed during the summer of 2015. Collecting the data for the primary modules of phases 1 and 2 in the global sample of cities started in late 2014, and financing of this work has been secured. UN-Habitat is firmly committed to making sure that the work is completed in time for Habitat III, scheduled to take place in October 2016. At the time of writing, plans for obtaining data from informants in the 200 cities in the global sample—albeit on a much more limited scale than that envisioned in this chapter—are in place, but budgets for these surveys have not yet been secured. There is good reason to believe that if adequate funds can be secured in time, the work on all three phases of monitoring global urban expansion can indeed be finished in time for the conference, providing planners for the first time with a new global data set that could be of great use to cities now confronting rapid population growth and the concomitant urban expansion.

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COMMENTARY
Michael B. Teitz

In his earlier work, Shlomo Angel made two significant contributions to the understanding of urban development. First, he refocused the attention of planners on the importance of arterial streets for rapidly growing cities in the developing world (Angel 2008). Second, he began to document global urbanization on the enormous scale that will occur over the coming decades (Angel 2012). That work required the assemblage of data on cities and world urbanization that had not previously been available. In this chapter, he reviews his conclusions about the importance of public streets, especially arterial roads, and proposes to extend his quantitative analysis to incorporate qualitative dimensions of world urbanization.

First, consider the share of land in streets. The appropriate scale for public capital in a market economy is an old topic of discussion that has recently been revisited by Thomas Piketty (2014). For Angel, the issue is the provision of public streets, especially arterial roads, which are key to efficient internal circulation in the fast-growing metropolitan areas of developing countries. He argues from theory, history, and current observation that many of these cities provide inadequate land for arterial roads in advance of urban expansion. These roads not only permit efficient traffic flow but also provide critical locations for major utilities, especially sewer and water lines. Without them, not only are cities (such as Bangkok) left in a permanent state of traffic congestion that is inefficient, injurious to public health, and environmentally damaging, but they are also unable to provide clean water and sanitation. Angel relates this situation to the evolution of a hierarchy of streets as cities grow in population and expand in area, suggesting that beyond a certain point, streets have to be planned and rights-of-way acquired before development occurs.

There is little to argue with in this proposition, which reflects the historic practice of successful cities that developed effective street grids together with plot layouts that provide access to affordable housing. A critical issue is how many and which developing cities are actually doing advance acquisition of land for arterial roads. Whether Angel can answer this question is not entirely clear, but it leads to the central problem raised in this section of the chapter: how can national and local governments be encouraged to do such advance work? I agree with Angel's conclusion that such activity is best seen as a public function, even in a squatter settlement context. The example of the Comas district in Lima, Peru, is encouraging, but has it been replicated elsewhere? In the many places without effective local government or squatter organizations, are there other strategies to achieve the same end? Can landowners be persuaded to collaborate to ensure a more effective urban pattern? For example, with appropriate legal means and guarantees, might landowners be persuaded to pool their land in the path of arterial roads, which could bring higher-density or more profitable development to the area and consequently result in greater profits for the landowners? The ex-

perimental efforts now under way are encouraging but will need to be replicated on a huge scale to meet the challenge of future urban growth.

Most of Angel's chapter explains his proposal to extend his work into a qualitative dimension. For this purpose, he will use a stratified sample of 200 cities—5 percent of the 4,043 cities and metropolitan areas worldwide with a population of 100,000 or more in 2010—beginning with a four-city test group. The metrics that he has developed embody urban quality, with initial data collection to be based on satellite imagery. Not surprisingly, the qualitative attributes he defines can be seen in this way, including arterial roads, housing sector evolution, street space, block size, and rooftop density. Supplementing the satellite data will be a survey module aiming to find information on five other attributes: basic services, affordable plots and homes, squatters, access to jobs, and public open space. An extended survey covering more attributes may occur later.

Overall, the project outlined is important and potentially valuable. However, some questions suggest themselves. First, is he missing some factors that contribute critically to metropolitan viability and urban quality? One factor that might be amenable to Angel's data strategy is the supply of locally grown food. Throughout history, cities have relied on local truck farms and other resources for much of the food residents consume. If anything, these sources might become even more important in the future as living standards rise. Studying this question would require finding land cover data sets for at least a subset of the sample cities, but at the risk of expanding an already large project, exploring this issue might repay the investigation.

A second question concerns the feasibility of the qualitative survey, given the difficulty of conducting surveys in developing countries. In particular, how will Chinese cities be accessed and addressed? Angel does not discuss the sampling strategy he will use for the enrichment of qualitative information that is necessary. Nonetheless, it is evident that this would be a major enterprise.

In a broader sense, how do these indicators reflect the quality of urban life? There can be little doubt that Angel's somewhat austere vision of urban quality is right for the stage of urbanization and economic development with which he is concerned. Attention to these issues as the basis for policy should yield great benefits in the short and medium term. But in the longer term, will these cities provide the environment their inhabitants need or would prefer? Or will they simply produce ever bigger versions of Houston or Beijing? Angel largely ignores the literature on urban design, urban quality, climate change, and sustainability that has emerged in Europe and the United States over the past four decades. In so doing, he rightly has his gaze on what is important right now in the emergent crisis. Nonetheless, should planners not also be asking whether it is possible to do better—to incorporate into the growth process elements that enhance the likelihood that the cities of the future will not simply repeat the errors of the past of places ranging from Bangkok to Los Angeles? How to do this is not self-evident, and perhaps it is unfair to ask it of those who are trying to address the overwhelming problems that cities now face. Angel's vision seems to replicate

that of the 1811 Commissioners' Plan for Manhattan, New York City. It could be argued that the New York commissioners' vision worked out pretty well, but what does it say about all the advances of the past 200 years that planners today seem to be able to do no better?

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4

Climate Change and U.S. Cities: Vulnerability, Impacts, and Adaptation

William Solecki

Cities throughout the United States are experiencing climate change through gradual shifts in climate variables and possibly as extreme events, both of which are changing the environmental baseline of these cities (Karl et al. 2009; Melillo, Richmond, and Yohe 2014). This chapter documents the state-of-the-art understanding of current and future climate risk for U.S. cities and urban systems, as well as for the residents who depend on them.

Contemporary climate change has created an era of increasing variability that is driving urban managers and residents to be more flexible and adaptive in response to the dynamic risks it presents. Urban infrastructure, such as water, energy, and transportation systems, is designed and managed to operate within an expected range of environmental conditions. If, as is expected, the impacts of climate change continue, and even increase, in the future, it will place great stress on this infrastructure.

Approximately 245 million people, or 80 percent of the U.S. population, now live in metropolitan areas that include core cities and extended suburban and exurban areas. This number is expected to grow to 364 million by 2050 (U.S. Census Bureau 2010). The built infrastructure (buildings and energy, transportation, water, and sanitation systems) that sustains these populations has become increasingly fragile, deficient, and vulnerable to climate change (Wilbanks et al. 2012). It is expected to become even more stressed over the coming decades and

Portions of this chapter were based on Cutter et al. (2014) and Solecki (2014).

will be unable, given the status quo, to support a high quality of life for urban residents—especially if the impacts of climate change are added to the equation (McCrea, Stimson, and Marans 2011).

As presented by global climate modeling scenarios, future climate change will manifest in cities as directional shifts in average annual climate-related conditions, such as higher temperature, more rapid sea level rise, and increased frequency and intensity of extreme weather events, including extended heat waves and more intense storms. Observed climate data from the early twentieth century to the present illustrate a shift in the frequency and magnitude of extreme events, particularly with respect to an increased rate of heavy-precipitation events and the occurrence of heat waves. Worst-case scenarios for future climate change include instances in which multiple extreme events occur simultaneously—for example, an extreme heat event coincident with a large coastal storm with a tidal surge and flooding. These climate-related shifts represent significant challenges, as well as potential opportunities, for urban areas.

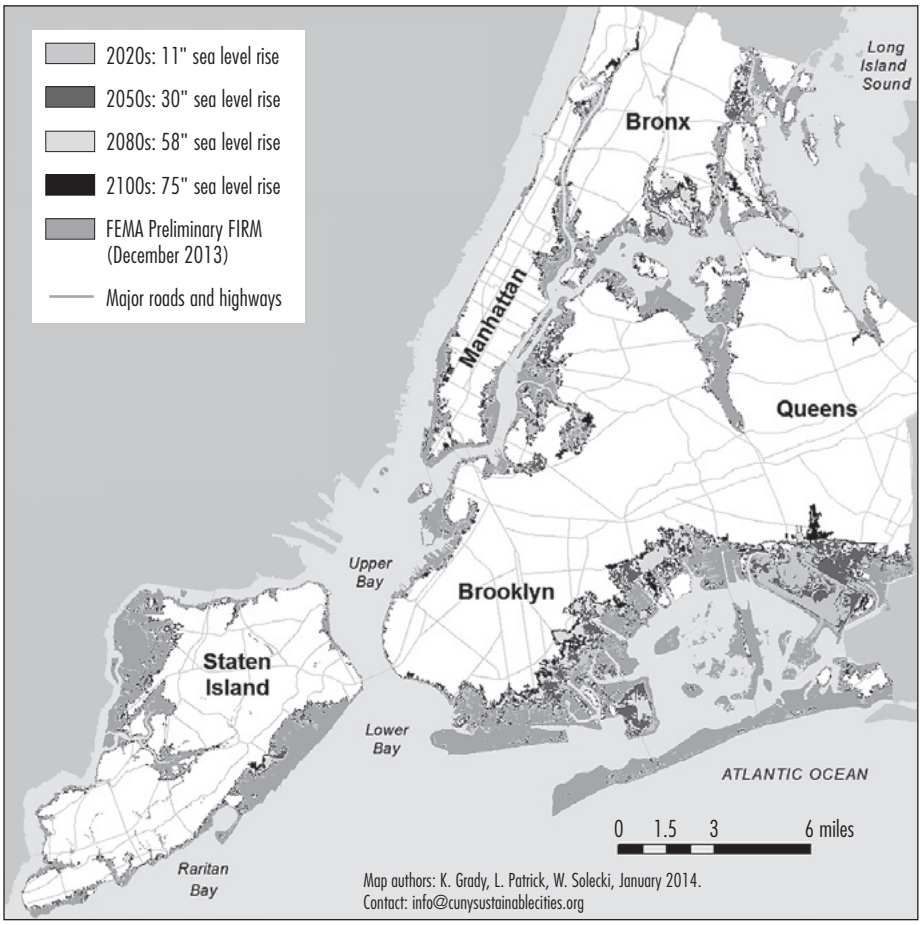
Cities have become early responders to climate change challenges and opportunities due to two simple facts: they have large and growing populations, and they depend on extensive infrastructure systems and the resources that support them (Rosenzweig et al. 2011). These systems often extend to, or derive from, rural locations at great distances from city centers. Urban residents are particularly vulnerable to disruptions in essential services in part because many infrastructure systems are interdependent. For example, electricity is essential to multiple systems, and a failure in the electrical grid can affect water treatment, transportation, telecommunications, and public health. As climate change impacts increase, significant numbers of people, including those living in cities and the extended suburbs of metropolitan regions, will be affected by climate-related events. As a result, many cities have begun adopting plans to address these impacts.

Key Climate Change Impacts on U.S. Cities and Urban Systems

In the short term, the most likely impacts of climate change will be acute—more-frequent extreme weather events and increased climate variability. Over the longer term, other threats, such as sea level rise, will compound the potential for more-frequent intense coastal storms. In New York City, for example, projected sea level rise will change the extent of the FEMA-designated flood zone that has a 1 percent chance of flooding annually. This is also referred to as the 100-year flood zone (figure 4.1).

A critical area for the review of climate effects is cascading system impacts and the associated vulnerabilities, which, together with urban service disruption, could result in wider-scale secondary social and economic costs. Increased impacts will result from the following four broad categories of climate changes: (1) increased frequency of extreme precipitation events; (2) increased frequency

Figure 4.1
Future 100-Year Flood Zones for New York City, 2020s–2100s



Note: Based on projections of the high-estimate 90th percentile sea level rise scenario.
Source: New York City Panel on Climate Change (2015).

of extreme heat days and heat waves; (3) sea level rise and coastal storm surge events; and (4) increased frequency of extreme wind events. Drought also could affect urban systems, but not to the broad degree seen in the other categories. Drought obviously will have the most impact on drinking water supplies. Table 4.1 is a list of climate risks within each category.

Major investments in cities will be necessary to adapt to climate change. For example, the location of urban transportation systems either at ground level,

Table 4.1
Climate Risks and Hazards That Will Impact U.S. Cities and Urban Systems

Climate Risk and Hazard	Potential Impact
1. Increased frequency of extreme precipitation events	Threat to human health and welfare Street-level Landslide Heavy snowfall
2. Increased frequency of extreme heat days and heat waves	Threat to human health and welfare Excessive heating of equipment and infrastructure; increased fatigue of materials Air-conditioning Wildfire Drought and water shortage Blackout (e.g., from power failure during peak load demand)
3. Sea level rise and coastal storm surge events	Widespread/threat to human health and welfare Wave action and scour Saltwater Saltwater/aquifer
4. Increased frequency of extreme wind events	Threat to human health and welfare Obstruction and loss of equipment (e.g., localized loss of power and overhead wiring) Large-scale

underground, or as elevated roads and railways changes the impacts of various climate variables, particularly flooding (Prasad, Ranghieri, and Shah 2009). Flooding can come from a variety of sources, including storm surges in coastal communities, riverine and lake flooding in inland areas, and street-level flooding from intense precipitation events. Infrastructure in low-lying areas in the floodplain and underground (such as tunnels, vent shafts, and ramps) are clearly at risk of flooding. To deal with flooding, transportation managers will require the use of numerous large-scale pumps, systems for debris removal, and the repair or replacement of key equipment, such as motors, relays, resistors, and transformers.

Besides sea level rise and storm surge vulnerability, steel rail and overhead electrical wires associated with transportation systems also are particularly vulnerable to excessive heat. Overheating can deform transit equipment, for example, causing steel rail lines to buckle and be thrown out of alignment, which can result in train derailments (Mehrotra et al. 2011). In addition, heat can reduce the life of train wheels and vehicle tires. Roadways made of concrete can buckle under extreme heat conditions, and asphalt roads can melt. Downed power lines and telecommunication systems can create additional risks in the transportation network due to power shortages or limited communications, particularly during extreme events and emergencies. Passengers also may experience more heat-

related illnesses due to higher temperatures and more-frequent heat waves. In response to these conditions, transit managers need to assess the capacity of their systems to respond to worst-case scenarios, including situations in which multiple hazards occur at the same time.

Urbanization, Urban Systems, and Climate Change Impacts

Residents of U.S. cities will be exposed to multiple threats—including property loss, disruption of daily life, and personal injury or health implications—as a result of the direct and interacting effects of climate change. Climate change affects the operation and utility of cities' built, natural, and social infrastructure, especially in coastal cities and other metropolitan areas that are subject to extreme climate events. The vulnerability of urban residents can increase when climate change impacts interact with other stressors often found in urban areas—such as aging and deteriorating infrastructure, concentrations of intense poverty, large concentrations of aged or infirm populations, clusters of high population density, and extended low-resource suburban areas.

The highly interdependent character of urban infrastructure will increase the possibility of cascading effects on most aspects of the urban, and even national, economy. As the urbanized landscape expands into suburban and exurban spaces, the potential for more-frequent and far-reaching system failures will be heightened (Leichenko and Solecki 2013). Suburban areas, which account for at least half of the total U.S. population, often have the same vulnerabilities as both higher-density urban areas and distant exurban areas (which are associated with limited and far-flung resource response capabilities). Additionally, suburbs often do not have the financial and institutional resources needed for effective and sustained adaptation and resilience efforts (Leichenko and Solecki 2013).

Different levels of vulnerability to climate change among urban populations is directly associated with their exposure to particular stressors, their sensitivity to impacts, and their ability to adapt to changing conditions (Depietri, Renaud, and Kallis 2012; Douglas et al. 2012; Emrich and Cutter 2011). For example, many major U.S. metropolitan areas that are located on or near the coast face higher exposure to particular climate impacts and thus face complex and costly adaptation demands (Cutter et al. 2014). It also should be noted that interaction between the ongoing processes of urban development and climate change will further alter cities' social and infrastructure vulnerability (NPCC 2010) and connected socioeconomic and engineering stressors (Wilbanks et al. 2012). In some cases, this might exacerbate the vulnerability and stressors, and in other cases, lessen them. In response to this issue, the City of New York initiated a comprehensive assessment in the early 2010s of specific building and construction codes and standards to identify changes that could be made to decrease future vulnerability and increase climate resilience.

City centers and their extended metropolitan regions depend on resource flows to and from other areas through complex infrastructure systems (CCSP 2008;

Cutter et al. 2014). Among these resources are food, water, energy, waste products, and other supplies, services, and products. Supply and service chains of this type can range in length from tens of miles to across the globe. Climate change can disrupt these chains and in turn adversely affect urban areas (Seto et al. 2012).

The connection between urban quality of life and vulnerability and resilience is related in part to the amount of redundancy in and the interconnection of resource supply chains and supporting infrastructure (Cutter et al. 2014; Kirshen, Ruth, and Anderson 2008). With proper redundancies in place, cities can respond effectively to disruptions of services and supplies.

Significant service disruptions can result when multiple systems are affected simultaneously and when climate risk impacts cascade from one system to another. For example, power supply interruptions after a major weather event affect public health systems, communication systems, transportation systems, and banking systems (Solecki 2014; Wilbanks et al. 2012). An example of this occurred on August 8, 2007, when New York City experienced an intense thunderstorm during the morning commute in which 1.4 to 3.5 inches of rain fell within two hours (MTA 2007). The rainstorm started a cascade of transit system failures—eventually stranding 2.5 million riders, shutting down much of the subway system, and severely disrupting the city's bus system (MTA 2007; Zimmerman and Faris 2010). Coupled with two other huge recent rain events that occurred in 2004 and early in 2007, this storm became the impetus for a full-scale assessment of transit procedures and policies in regard to climate change (MTA 2007, 2009; Solecki 2014; Zimmerman and Faris 2010).

Cutter et al. (2014) and Wilbanks et al. (2012) examined several major infrastructure disruptions in the United States over the past decade, including the 2011 San Diego blackout, the 2003 Northeast blackout, and Hurricanes Katrina (2005), Irene (2011), and Sandy (2012). According to Wilbanks et al. (2012), the greatest losses from such extreme events may be distant from the event itself. For example, Hurricane Katrina disrupted oil terminal operations in southern Louisiana not because of direct damage to port facilities, but because workers could not reach work locations through surface transportation routes and could not be accommodated locally because of the disruption of potable water supplies, food shipments, and housing facilities (Myers, Slack, and Singelmann 2008). Conversely, in the wake of Hurricane Sandy, the New York metropolitan area suffered from a severe gasoline shortage not only because of the loss of power at local gas stations and the increased difficulty of employees getting to work, but also, and more importantly, because of the physical damage to gas transfer facilities located at the water's edge, which significantly limited the capacity of the supply chain and the ability to transport large volumes of gasoline into the region.

The most recent U.S. National Climate Assessment (2014) documents that changes in many extreme weather and climate events have been observed over the past several decades. These changes include a decrease in the number of cold days, an increase in the number of warm days and nights, and an increase in the frequency or intensity of heavy-precipitation events. It is expected that climate

change will continue to influence the frequency and severity of these events. The potential effects could take several different trajectories, as shown in figure 4.2, which illustrates extreme event shifts with and without climate change. Changes in extremes include a simple shift in the mean, resulting in, for example, less extreme cold weather and more extreme hot weather (figure 4.2a). Another scenario illustrates a condition of increased variability with a greater number of extreme events at both tails of the distribution (figure 4.2b). A third possibility includes a change in overall symmetry in the distribution of extreme events (figure 4.2c). Translating these projected shifts to New York City, the number of days with temperatures greater than 32.2°C (90°F) will increase from a baseline of 18 days during 1971–2000 to as many as 57 days in the 2050s.

Extreme event frequency can be best understood by examining the past, current, and future conditions of heat stress. It is virtually certain that there will generally be more and longer hot temperature extremes and fewer cold temperature extremes over most land areas on daily and seasonal time scales as global mean temperatures increase (IPCC 2012). In some areas, rapid urban development or land use change will create or exacerbate urban heat island conditions, resulting in substantially greater temperature increases. Urban heat islands result from the changes in local and regional energy balances associated with intense urban development. These changes cause warmer temperatures in cities as opposed to outlying exurban and suburban areas. The urban heat island phenomenon is particularly evident at night.[1]

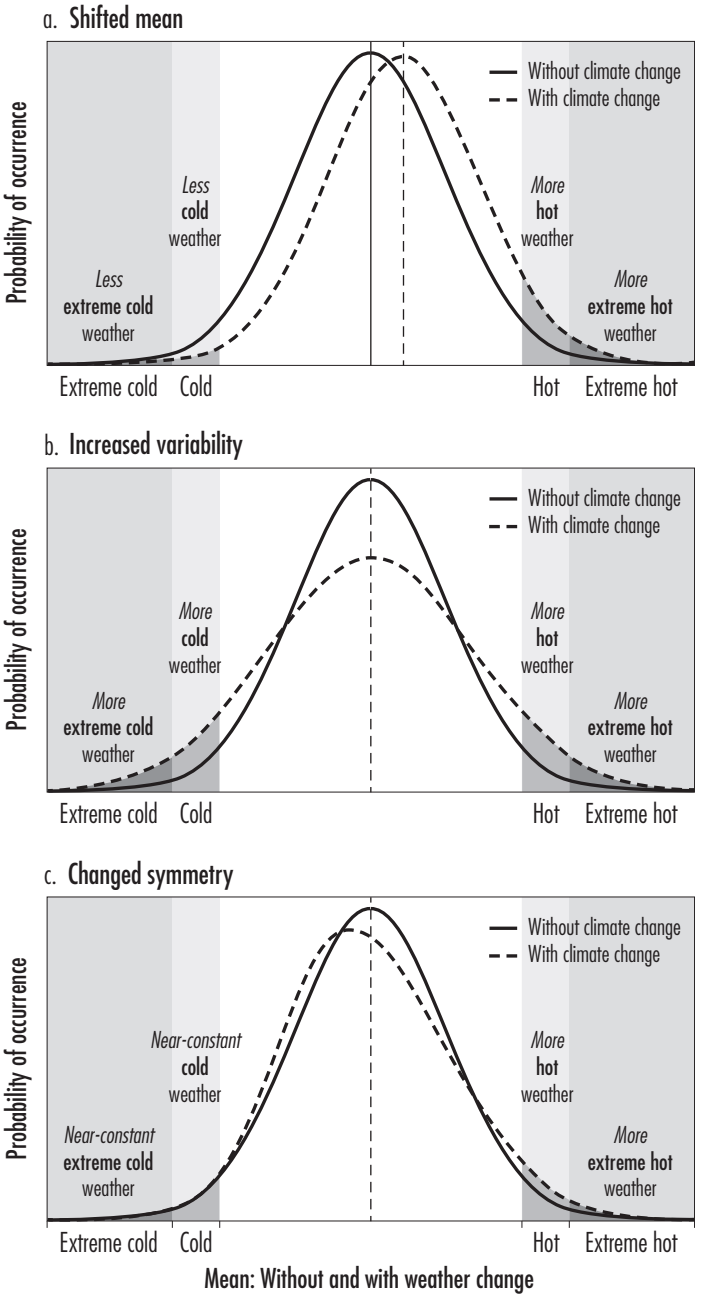
Social Vulnerability to Climate Change in U.S. Cities

Social vulnerability describes characteristics of populations that influence their capacity to prepare for, respond to, and recover from hazards and disasters (Adger 2006; Cutter, Boruff, and Shirley 2003; Füssel 2007a; Laska and Morrow 2006). Social vulnerability also refers to the sensitivity of a population to climate change impacts (Cardona et al. 2012). The characteristics that most often influence differential impacts include socioeconomic status (wealth or poverty), age, gender, special needs, race, and ethnicity (Bates and Swan 2007; NRC 2011; Phillips et al. 2010). Further, inequalities reflecting differences in gender, age, wealth, class, ethnicity, health, and disabilities also influence coping and adaptive capacity, especially to climate change and climate-sensitive hazards (Cutter et al. 2012).

The urban elderly are particularly sensitive to heat waves. Often they are physically frail, have limited financial resources, and live in relative isolation in

1. Observed global temperature data have been partially corrected for the urban heat island effect. It is unlikely that any uncorrected urban heat island effects and land use change effects have raised the estimated centennial globally averaged land surface air temperature trends by more than 10 percent of the reported trends.

Figure 4.2
Changes in Distribution of Weather Extremes with and Without Climate Change



Source: IPCC (2012).

their apartments. They may not have adequate cooling (or heating) or be able to temporarily relocate to a cooling (or warming) station. This combination of factors led to a significant number of elderly deaths during the 1995 Chicago heat wave (Klinenberg 2003). In New Orleans, social inequalities based on race, gender, and class strongly influenced the capacity of residents to prepare for and respond to Hurricane Katrina (Brinkley 2007; Horne 2008; Weber and Peek 2012). It is difficult to assess the specific nature of the vulnerability of subpopulations. Urban areas are not homogeneous in terms of the social structures that influence inequalities. Also, the nature of the vulnerability is context specific, with both temporal and geographic determinants, and these factors also vary between and within urban areas.

Hurricane Sandy illustrates many of the extreme event impacts on U.S. cities. It made landfall on the New Jersey shore just south of Atlantic City on October 29, 2012, and became one of the most damaging storms ever to strike the continental United States. Sandy affected cities throughout the Atlantic seaboard, extending across the eastern United States to Chicago, where it generated 20-foot waves on Lake Michigan and flooded the city's Lake Shore Drive. The storm's strength and impacts were increased by two contributing factors: (1) the waters of the Atlantic Ocean near the coast were roughly 3°C (5°F) above normal; and (2) the region's coastline is experiencing sea level rise as a result of global warming.

Sandy caused significant loss of life and tremendous destruction of property and critical infrastructure. The death toll in the metropolitan region exceeded 100, and damage estimates range up to $62 billion. At its peak, the storm cut electrical power to more than 8.5 million customers. It affected millions of coastal zone residents across the New York–New Jersey metropolitan area, in spite of the fact that the region is relatively well prepared for a coastal disaster.

The death and injury; physical devastation; multiday power, heat, and water outages; gasoline shortages; and cascade of collapses resulting from Sandy reveal what can happen when the complex integrated systems upon which urban life depends are stressed and fail. When the Con Edison electricity distribution substation in lower Manhattan failed at approximately 9:00 p.m. Monday evening, its flood protection barrier (designed to be 1.5 feet above the 10-foot storm surge of record) was overtopped by Sandy's 14-foot surge. As the substation stopped functioning, it immediately caused a systemwide loss of power for more than 200,000 customers. Residents in numerous high-rise apartment buildings were left without heat and lights, elevator service, and water (which must be pumped to upper floors). A situation that was initially seen as a novelty or inconvenience rapidly became a potential public health disaster.

Sandy also highlighted the vast differences in vulnerabilities across the extended metropolitan region. Communities and neighborhoods on the coast obviously were most vulnerable to the physical impact of the storm surge. Many low- to moderate-income residents live in these areas and suffered damage to or loss of their homes, leaving tens of thousands of them displaced or homeless. As a specific subpopulation, the elderly and infirm were highly vulnerable, especially

those living in the coastal evacuation zone and those on upper floors of apartment buildings left without elevator service. Those individuals had limited adaptive capacity because they could not easily leave their residences.

Even with the extensive devastation, the effects of the storm would have been far worse if local resilience strategies had not been in place. For example, the City of New York and the Metropolitan Transportation Authority worked aggressively to protect life and property by ceasing operation of the city's subway system before the storm hit and moving the cars out of low-lying, flood-prone areas. At the height of the storm surge, all seven of the city's East River subway tunnels flooded. Catastrophic loss of life would have resulted if subway trains had been operating in the tunnels when the storm struck.

The storm fostered vigorous debate among local and state politicians, as well as other decision makers and stakeholders, about how best to prepare the region for future storms—especially given the expectation of increased flooding frequency resulting from more numerous extreme precipitation events.

Climate Adaptation and Resilience Practice

Cities in the United States have begun to consider the challenges of climate change and possible strategies for adaptation and enhanced resilience (Cutter et al. 2014). Preparation efforts include planning for ways in which infrastructure systems and buildings, ecosystem and municipal services, and residents will be affected by climate change. Based on a 2011 survey of city managers, Carmin, Nadkarni, and Rhie (2012) reported that 58 percent of respondents indicated that their cities were moving forward on "climate adaptation"—defined as any activity to address the impacts that climate change could have on a community. Activities range from assessment to planning to implementation, with the vast majority focused on the early stages of action, including preliminary planning and discussion (Carmin, Nadkarni, and Rhie 2012). Other early activities include education and outreach on how climate action can take place, often with a focus on both adaptation and mitigation (i.e., the reduction of greenhouse gas emissions) and the interplay between them (Solecki, Patrick, and Springings 2015).

Two general models of how climate action emerges within cities have been identified (Cutter et al. 2014): (1) cities develop separate climate initiatives, often with complete adaptation plans (Carmin, Nadkarni, and Rhie 2012; Zimmerman and Faris 2011); or (2) they integrate adaptation efforts into general government services, operations, and planning efforts, as seen in Seattle; Portland, Oregon; Berkeley, California; and Homer, Alaska (Wilbanks et al. 2012). Some cities connect climate action planning to particular sectors, such as the water supply, other critical infrastructure, coastal zone management, economic development, or public health (City of Santa Cruz 2012; Cooney 2011; Füssel 2007a, 2007b; Maibach et al. 2008).

U.S. cities are employing many different strategies to promote adaptation efforts within their communities. Collaboration within and across individual

municipal agencies is often required (Carmin, Nadkarni, and Rhie 2012). Many cities emphasize data and information sharing and outreach in order to facilitate coordination and enhance opportunities for support from local officials, residents, and other stakeholders (Moser and Ekstrom 2011). In addition, national and international city networks focused on climate change have emerged in the past decade. Organizations such as the C40, ICLEI, and Mayors Summit have been instrumental in linking cities together. Some cities have developed independent partnerships to work on these issues. New York, London, and Tokyo, for example, regularly communicate on topics related to climate adaptation and mitigation.

Emerging local adaptation policies are actively being integrated into national and state policies. Many states have conducted comprehensive studies on the potential risks of climate change and have shared their results with local authorities and stakeholders. Currently, there are no national-level regulations focused on urban adaptation, but there is a series of federal initiatives designed to promote adaptation and resilience within communities. The U.S. Department of Housing and Urban Development (HUD) has taken a leadership role in this regard in the post-Sandy context, especially through the use of design competitions to promote climate change adaptation. Other federal agencies are connected to climate adaptation through existing mandates and regulatory requirements (Cutter et al. 2014). Federal policies, such as the National Environmental Policy Act (NEPA), could play an important role in future adaptation opportunities. NEPA, through the impact assessment provision and evaluation criteria process, could be used to provide incentives for adaptation strategies for managing federal property in urban areas (Wilbanks et al. 2012; USBR 2011; USFWS 2010).

At the local level, municipal policies and planning strategies also can be adjusted to promote climate adaptation (Dodman and Satterthwaite 2008; Wilbanks et al. 2012). Such strategies include a broad range of building codes and standards, zoning regulations, land use planning, drinking water supply management, green infrastructure initiatives, public health and healthcare planning, and hazard mitigation efforts. In the post-Sandy context, the City of New York initiated modifications of building codes and standards that have a direct bearing on climate adaptation, such as requiring people building new structures in coastal flood zones to take sea level rise into consideration in construction plans (Solecki and Rosenzweig 2014).

Although adaptation advancements have been made in many cities, a range of barriers to action have been identified (Cutter et al. 2014). Key limitations include lack of capital and human resources, lack of clear scientific data and information on climate risk, and adaptation strategy effectiveness (CEQ 2011). In some cases, efforts are also hindered by a lack of commitment or engagement with the issue of climate change—that is, is it viable to engage politically with the issue? In many cities, the term *climate adaptation* has been replaced by *climate resilience*, which focuses more on immediate and future risks and does necessarily acknowledge climate change as a scientific reality. To ensure support of local

initiatives, some cities, especially large cities such as New York, Chicago, Los Angeles, and Seattle, have undertaken efforts to promote understanding of current changes in the climate and predictions of future changes (see as an early example a report prepared for the City of Chicago in 2008 [City of Chicago 2008]). New York has been most aggressive, with the creation of the New York City Panel on Climate Change, comprising local academic experts and public and private sector representatives, to assess current and future climate risks to the city's critical infrastructure and general quality of life (Rosenzweig et al. 2011).

Specific metropolitan and municipal agencies (e.g., water supply utilities, transit agencies, and public health agencies) are now actively involved in climate risk reduction and adaptation. In New York City, the Department of Environmental Protection (which manages the city's water supply), the Department of Health, and the Metropolitan Transit Authority (a state-level entity that operates the city's and suburban transit systems) all have been engaged in vulnerability assessment and climate resilience since the late 2000s.

Other emerging climate change actors include the wide diversity of local civic organizations that have begun to focus on climate adaptation and resilience (Moser 2009). In some cases, these groups have been engaged by local governments, and in others they have taken up the issue on their own. Public involvement in adaptation planning and implementation has helped ensure meaningful climate action and provide valuable feedback to policy makers (Carmin, Dodman, and Chu 2011; Van Aalst, Cannon, and Burton 2008). Local groups have helped identify vulnerable populations (Foster, Winkelman, and Lowe 2011) and motivate local officials and others to promote community action. The Boston Climate Action Leadership Committee, for example, was initiated by the Mayor's Office with the expectation that the committee would rely on public consultation to develop recommendations for updating the city's climate action plan (City of Boston 2010, 2011). In New York in the wake of Hurricane Sandy, environmental groups such as the New York Environmental Justice Alliance and the Alliance for a Just Rebuilding have worked aggressively to highlight vulnerable populations and promote justice-focused climate resilience actions.

In many cases, focusing events play a significant role in spurring agencies and organizations into action. This action can in turn have a positive effect on other elements of government. For instance, in New York City the MTA has been highly focused on climate risk and enhanced climate dynamics since the intense rainstorm of August 7, 2007, shut down most of the city's subways and resulted in massive ridership disruption and loss of business. Hurricanes Irene (2011) and Sandy (2012) presented additional opportunities and policy windows to catalyze new and larger-scale climate action. Irene caused approximately $65 million in damage to the MTA (MTA 2012), and Sandy dealt the transit system an even bigger blow, resulting in approximately $4.75 billion in damage, much of it resulting from the storm surge (MTA 2013).

MTA system managers have begun assessing the potential impacts of enhanced climate variability and change, considering both immediate and long-term

effects. Immediate impacts would include loss of revenue from train cancellations and expenses to restore damaged assets and infrastructure. Longer-term impacts would be associated with increased capital expenditures for replacing and updating infrastructure, such as engineering, signaling, and power distribution facilities, and with increased expenses to pay for training of system operators and staff. A spectrum of significant adaptation challenges face the MTA, not the least being how to pay for retrofitting the existing systems to meet emerging climate risks. The MTA has taken a series of short- and longer-term steps to address these challenges, including launching 36 construction projects with a total value of $578 million and initiating another 151 projects in planning, design, and procurement for a total of $777 million in contracts now under way. Much of the funding for these projects has come from the federal government. The MTA's approach to resilience includes three elements: (1) protective measures to keep water out; (2) asset protection to minimize damage if water enters the system; and (3) recovery measures to expedite restoration of service.

The involvement of the private sector can also be influential in promoting city-level adaptation. Many utilities, for example, have asset management programs that address risk and vulnerabilities. These programs could also address climate change, but to date there are few examples of such involvement. Instances in which cooperation has taken place include property insurance companies and engineering firms that have provided consulting services to cities (NRC 2011; Wilbanks et al. 2012). For example, engineering firms that create infrastructure system plans have begun to account for projected changes in precipitation in their projects (Van der Tak et al. 2010). Regarding city and regional infrastructure systems, recent attention has focused on the potential role of private sector–generated smart technologies to improve early warning of extreme precipitation and heat waves, as well as establishing information systems that can inform local decision makers about the status and efficiency of infrastructure (IBM 2009; NRC 2011).

Uncertainty, in both the climate system and modeling techniques, is often viewed as a barrier to adaptation action (Corfee-Morlot et al. 2011; Mastrandrea et al. 2010). Urban and infrastructure managers, however, recognize that uncertainty values and metrics will continue to be refined and that it is prudent to use an incremental and flexible approach to planning that draws on both structural and nonstructural measures (Carmin and Dodman 2013; NRC 2011; Rosenzweig et al. 2010).

Another important challenge to policy makers is obtaining the commitment and support of local elected officials for adaptation planning and implementation (Carmin, Nadkarni, and Rhie 2012). Cities and administrators face a wide range of other issues demanding their attention and competing with climate adaptation for limited financial resources (Leichenko and Solecki 2013; NRC 2011).

Adaptation planning and practice in extended metropolitan regions and associated regional systems is additionally inhibited by the challenge of coordinating efforts across many jurisdictional boundaries. Regional government

institutions may be well suited to address this challenge, as they cover a larger geographic scope than individual cities and have the potential to coordinate the efforts of multiple jurisdictions (Wilbanks et al. 2012). California requires each of its metropolitan planning organizations to prepare a sustainable communities strategy (SCS) as part of its regional transportation plan (California Senate 2008). While the focus of the SCS is on reducing emissions, some plans have also addressed topics related to climate change impacts and adaptation (SACOG 2012; SANDAG 2011; SCAG 2012). Examples of climate change issues that could benefit from a regional perspective include water shortages, transportation infrastructure maintenance, and loss of native plant and animal species.

Integrating climate change action into everyday city and infrastructure operations and governance, referred to as *mainstreaming*, is an important planning and implementation tool for advancing adaptation in cities (NRC 2011; Rosenzweig et al. 2010). These efforts can forestall the need to develop a new and isolated set of climate-change-specific policies or procedures (Foster, Winkelman, and Lowe 2011). Adopting this strategy would enable cities and government agencies to take advantage of existing funding sources and programs and to achieve co-benefits in areas such as sustainability, public health, economic development, disaster preparedness, and environmental justice. Pursuing low-cost, no-regrets options is a particularly attractive short-term strategy for many cities (Foster, Winkelman, and Lowe 2011; NRC 2011).

Over the long term, responses to severe climate change impacts will likely require major expenditures and structural changes, especially in urban areas (NRC 2010; Wilbanks et al. 2012). When major infrastructure decisions need to be made in order to protect human lives and urban assets, cities must have access to the best available science, decision support tools, funding, and guidance. In this regard, local officials look to the federal government to provide adaptation leadership, financial and technical resources, and funding for cutting-edge research (CEQ 2011; Foster, Winkelman, and Lowe 2011; NRC 2011).

Overall, empirically defining the benefits and costs of adaptation strategies has proved to be very challenging, particularly to the extent that they could be included in decision-making strategies and protocols. Very few highly detailed assessments of benefits and costs have been conducted, especially with respect to the benefits of different types of interventions. For climate adaptation and resilience planning to move to the next step, this type of data must be gathered, and the capacity to translate it into appropriate public or private decision-making frames must be created.

Conclusions

It is clear that climate change has begun to impact U.S. cities and to shift the environmental baselines of these locales. It is also evident that city managers and residents have begun to actively engage in the discussion of how to promote cli-

mate adaptation and resilience within their cities. One of the greatest challenges they face is how to define and frame the actions that could be taken. In many cases, there is a tendency to focus on engineering and safety measures that will enable a city to "bounce back" after a disaster. While those efforts are logical and laudable, the greater challenge is to embrace the broader, longer-term aspects of adaptation and resilience, which, given the projections for future climate change, could require more profound transformative actions undertaken by metropolitan and municipal authorities and urban residents themselves. In short, adaptation efforts and resilience planning will increasingly demand flexibility and the capacity to adjust as climate science and the risks of climate change evolve.

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COMMENTARY

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Publication of the 2014 U.S. National Climate Assessment (Melillo, Richmond, and Yohe 2014) has brought climate change back into the national policy debate and contributed to a shift in focus from mitigation to adaptation. That shift has also been stimulated by recent experiences with extreme weather events across the United States, highlighting the wide range of vulnerabilities that exist, including those to droughts and flooding, heat waves and cold spells, hurricanes, wildfires, and sea level rise. These events are in turn played out against the backdrop of

- an aging and deteriorating infrastructure, which makes services such as sanitation, transportation, and cooling and heating more difficult and costly to deliver;
- population growth, which leads to higher demands for goods and services and the infrastructure to deliver them;
- increased urbanization, which results in higher geographic concentrations of people and assets at risk;
- greater regional, national, and international competitiveness, where cost savings drive policy and investment decisions, which can result in the loss of redundancies that may be important for the provision of goods and services during extreme events; and
- a tightening of city and town budgets, which occurs alongside growing expectations and pressure for local jurisdictions to address local problems.

None of this is new information, but it is nicely summarized and placed in context by William Solecki, who draws heavily on the U.S. National Climate Assessment and other recently published research. Rather than reflect on what is, by now, well-accepted fact, I wish to ask and begin to answer the following questions raised by the information presented in the chapter:

1. What is the role of cities in climate action?
2. What are the informational needs for decision making?
3. What will it take to really advance urban resilience?

The Role of Cities in Climate Action

Climate change serves as a magnifier of existing needs, such as the need for electricity to run air conditioners, the need for water to grow food and maintain ecosystem functions, the need for transportation to evacuate people during extreme events. And wherever climate change leads to beneficial conditions—where growing seasons are extended, tourism increases; when polar ice melts, an international shipping lane opens in the Arctic—those benefits are fleeting, because the

climate will not stop changing once a more desirable situation has been reached. In addition, the benefits may bring with them negative consequences: the extension of growing seasons means longer periods in which agricultural pests are active and perhaps can move to other locations, tourists will become more fickle as weather conditions become more difficult to predict, and international conflict over fragile global trading routes will likely increase. In short, climate change not only magnifies existing needs but also multiplies threats.

Cities can, in principle, play an active role in shaping the needs of their citizens and in containing the threats to which they are exposed. Where people live and how they live has far-reaching implications for land use, transportation, and a host of other issues in nonurban as well as urban settings, because cities draw on natural resources, financial capital, and people both regionally and globally.

Land use and transportation within cities, the building and consumption choices of households, and the energy needs of firms all affect urban emissions and radiation budgets. As a consequence, cities account for about half of the temperature anomalies they experience (Stone 2012) and have considerable influence over storm water infiltration and flood control as well. Changes in land use planning and building codes; promotion of decentralized power generation and use of local foods, materials, and energy sources; reduction in transport needs; control over the expansion of impervious surfaces; maintenance of ecosystems; and many more activities available to cities can improve the quality of life within them. Such activities tend to spill over into people's lifestyles and livelihoods in nonurban areas as well. As a consequence, urban climate action has considerable co-benefits beyond a reduction of greenhouse gas emissions and climate change vulnerabilities (Ruth and Coelho 2007; Ruth and Franklin 2014).

The Informational Needs for Decision Making

Quite naturally, researchers interested in understanding climate impacts have used climate models as a starting point for the identification of challenges decision makers will inevitably face. For example, much research has gone into downscaling global climate models to arrive at ever finer spatial and temporal resolutions of the ways in which climate change may unfold. Aside from the great intellectual and computational challenges that characterize such work, it is motivated by the perceived need that local decisions must be based on climate information that is available for the scales at which decisions are made—such as neighborhood-level analyses that suggest the improvement of floodwater controls to manage runoff from extreme precipitation or the city block–level assessments that help identify strategies to provide vulnerable populations with cooling services during a heat wave. In theory, that is a valid claim. In practice, however, for downscaled climate models to be useful, the information they present must be at a spatial and temporal resolution that is commensurate with that of the social, economic, and biophysical processes that are to be shaped by the decisions being made. For example, information on the hourly manifestations of a heat wave affecting

different parts of a city loses its impact when data about the city's population and businesses are derived from a decennial census, when energy consumption data are available only at monthly time scales and aggregated across all energy sources by fuel type, and when the daily behavioral patterns of inhabitants are only coarsely understood.

Rather than simply push climate information onto decision-making communities (or have them ask for that information without asking other important questions about the processes that shape social and behavioral outcomes), the agenda must be to identify sufficiently precise data on the social, economic, and biophysical changes that are caused by, and that affect, local manifestations of climate change—data that match the resolution of the available climate information. But how can those data be identified and collected? What are the roles of existing institutions and civil society in managing, sharing, and using that information? What are the mechanisms by which that information is delivered to decision makers, and how can and do they contribute to and shape the processes of information collection and delivery? Recent advances in crowdsourcing, data mining, "big data" analysis, knowledge fusion, and visualization may help overcome some of these challenges, but the institutional capacities and infrastructure need to be put in place to effectively integrate those data with climate information.

Of course, as the spatial and temporal resolution of climate, socioeconomic, and biophysical models increases, and as models are integrated to explore how climate affects cities and cities affect climate, inaccuracies and uncertainties will propagate. The notion of growing uncertainties is especially relevant when the models are used to look into the distant future—50 or 100 years from now, which are not unreasonable time scales, given that infrastructure and land use decisions today are made over those time frames as well.

As a consequence of persistent uncertainties and emerging surprises, the idea of finding optimal adaptation strategies becomes nonsensical. Indeed, the goal of policy making and investing in adaptation plans must be to find strategies that make good sense for a wide range of potential futures and to adapt as climate and society change. To be able to identify, politically accept, and implement those strategies, and then revisit, reassess, and adjust them over time, will require considerable institutional innovation and new abilities to appreciate and embrace risks and uncertainties.

Advancing Urban Resilience

Should urban resilience be an end goal of climate action or be subsumed under a broader sustainability agenda? Several general observations hold when judging whether cities should emphasize resilience over sustainability, or sustainability over resilience. First, improving resilience is a necessary but not sufficient condition for sustainability. Conversely, strategies that promote sustainability will help reduce climate (and other) vulnerabilities. Second, the starting point for policies

to promote sustainability is usually quite different from that for many policies currently propagated under the resilience mantle. In many cases, a focus on short-term resilience gains will jeopardize long-term sustainability goals, such as when infrastructure is fortified to withstand ever more extreme climate events, at considerable material and energy costs. Rather than stimulate economic growth to generate the resources needed to combat climate change and its impacts—which, in essence, are the product of economic growth—policy will need to promote the just and equitable distribution of wealth within the constraints placed by natural ecosystems on the availability of environmental goods and services, such as resources and waste absorption (Daly 2005). Third, the promotion of just and equitable intra- and intergenerational distributions of wealth will in turn entail educational, economic, social, and other initiatives that will help address the needs magnified by climate change. Thus, it is not the social, economic, and environmental co-benefits of climate action that cities should hope and strive for as they implement their climate action plans. Instead, the strategy must be to pursue sustainability, and through that generate resilience as a co-benefit.

If improvements in urban resilience, climate adaptation, and greenhouse gas emission reductions are to be successful in the long run, the root causes of unsustainable economic, social, and environmental conditions will need to be addressed. The heightened attention to climate impacts, urban vulnerabilities, and adaptation found in Solecki's work and others', while perfectly understandable, urgent, and important, may well fall short in creating long-term viable and desirable outcomes unless resilience is seen and generated as a by-product or feature of sustainability.

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Taxation

5

The Past and Future of the Urban Property Tax

Grant Driessen and Steven M. Sheffrin

The paths to potential increases in revenue for cities, and property tax revenue in particular, differ sharply across the United States. Consider the recent experiences in New Orleans compared with a hypothetical California city. In April 2014, New Orleans mayor Mitch Landrieu was desperately seeking revenue to fill a large budget gap (Bridges 2014a, 2014b). The combination of federal consent decrees mandating reforms in the New Orleans Police Department and the Orleans Parish Prison was forecast to cost the city at least $20 million. In addition, the courts had rejected the city's attempt to reduce payments to the Firefighters Pension and Relief Fund—despite a history of overgenerous benefits and an ill-fated hedge fund investment in the Cayman Islands—which added another $17 million to the bill. Overall, the city needed to fill a gap equal to 7 percent of its general fund.

Landrieu wanted to fill this gap through taxation. Initially, he proposed three different tax increases. The first was an addition of 75 cents to the very low statewide cigarette tax of 36 cents, just for New Orleans. Aside from the wisdom of a relatively small city trying to raise its excise tax above that of its neighboring parishes, the tax faced a number of political obstacles. It would have to be passed by the state legislature, signed by the governor (who had opposed raising the statewide tax), passed by the city council, and then finally put before the voters of New Orleans.

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The second proposed tax was an increase in the city's hotel tax, from 16.44 percent to 18.19 percent. This tax would face the same political hurdles as the cigarette tax. It also raised concerns that New Orleans might price itself out of the competitive market for hosting conventions. Hearing this opposition, the Landrieu administration floated another idea—a special development district that would allow the city to collect all the sales and hotel taxes within the district. The genius of the proposal was that the development district was all about future (not existing) revenue streams, but the reaction of the entities that would have had revenue diverted—the state, the Orleans Parish School Board, the New Orleans Convention Center, and the Superdome—was not favorable. Unfortunately for the mayor, the legislature failed to adopt the new cigarette tax, the hotel tax increase, or the special development district.

The third prong of the mayor's tax strategy was a change in the property tax. Landrieu wished to raise the millage rates for police and fire protection. The legislature would have to pass a bill (not requiring the governor's approval) to amend the constitution to permit this additional taxation authority. Voters, both statewide and in Orleans Parish, would have to approve the change. The New Orleans City Council would then have to authorize a second vote in New Orleans for any specific increase. Finally, the city council would have to authorize the voter-approved increase. All told, this would not be an easy road for the mayor. The bill did pass the legislature in 2014; it was narrowly approved by the voters in November of that year and approved by the city council shortly thereafter.

In New Orleans, the restrictions on increases in the millage rates for police and fire protection are more stringent than those on general parish or municipal rates. The Louisiana Constitution allows the latter to be raised by a majority vote in an election. Louisiana cities and parishes also possess the ability to increase their property taxes when assessments increase. Initially when assessed values increase, rates are "rolled back" to hold the level of revenue constant. But the governing body can vote to "roll forward" the rates and take advantage of the higher assessed values. Overall, property tax collections are limited by the very generous homeowner exemption of $75,000, which is approximately one-half median housing prices in Louisiana and the New Orleans metro area. The homeowner exemption does not apply to the police and fire protection millage rates in the city, however.

Now consider a large California city. Proposition 13 prohibits the city from taking any policy actions to increase its property tax revenue (O'Sullivan, Sexton, and Sheffrin 1995). This revenue consists of the city's apportioned share of the county's revenue through a complex formula developed in the aftermath of Proposition 13, which was passed in 1978 (McCarty et al. 2002). A county's property tax is determined by the constitutionally required rate of 1 percent times the base of assessed value. Personal property is assessed at market value, but real property follows the assessment provisions of Proposition 13, which effectively limit increases to 2 percent a year until a property is sold. The assessor is elected at the

county level, so cities lack even the minimal leverage that comes in administering the tax.

This does not mean that property tax revenue cannot be increased. Revenue increases as housing prices increase, but not more than 2 percent. With the turnover of properties, revenue can increase substantially more. Thus, in boom times, increased turnover (bringing properties to market value) and normal 2 percent increases can lead to substantial revenue increases. Revenue can also fall if housing prices fall, as they did in California in the early 1990s and during the Great Recession. A property can be reassessed downward, but not below its factored base year value (acquisition cost plus 2 percent per year) (Sheffrin and Sexton 1998).

Cities in California can seek other property-related revenue through parcel taxes, but these taxes require a supermajority vote of the state legislature and must be a flat amount for each parcel. Fees related to property also are limited by Proposition 218, another constitutional amendment (Dresch and Sheffrin 1997; Sheffrin 1998). Yet California's homeowner exemption is only $7,500, compared with $75,000 in Louisiana, and median housing prices in California—approximately $400,000—are significantly higher than those in Louisiana. Taking into account all these differences, the same percentage increase in housing prices in California and Louisiana will bring in considerably more revenue in California at a similar tax rate.

Which city, New Orleans or the hypothetical California city, faces the bigger challenge in sustaining property tax revenue over time? California is the poster child for tax limitation, but as we have seen, the political obstacles to raising additional property tax revenue in Louisiana also are formidable. Other features of Louisiana's property tax system—a generous homeowner exemption and low median housing prices—also limit its potential to generate urban revenue over the long term. It is not clear that a city in California is worse off than a city in Louisiana in terms of long-term reliance on property tax revenue (even though it may have less immediate discretion).

While these are just two examples, each urban area faces its own unique political and social constraints on property tax rates and assessments. Property markets differ across urban areas as well, with different mixes of residential versus commercial property and differences in prices. All of these factors determine how much a jurisdiction can rely on the property tax over time to support its revenue base. Looking into the future, however, requires recognizing that formal differences in political structures may not be sufficient to explain patterns in property tax statutes across jurisdictions. Reading property tax statutes, though informative, is simply not enough. Nor are speculations based on thoughtful political-economic trends, as offered in Sheffrin (1998).

This chapter explores the role the property tax plays now and can potentially play in the future using an unabashedly empirical approach. We believe that the past is prologue; as a consequence, we begin our look into the future of the

urban property tax by examining how a diverse group of cities have relied on the property tax as a component of their own-source revenue over roughly the past 30 years.

We are fortunate to be able to draw on a new and underutilized data source, the Lincoln Institute of Land Policy's Fiscally Standardized Cities (FiSC) database[1] (Lincoln Institute of Land Policy 2014a). This database addresses the problem posed by the fact that cities across the country have potentially many different types of political relationships with their counties, school boards, or special districts. For example, some cities encompass property-tax-funded schools within their budgets, while others have legally separate school districts, and property tax revenue is not part of their budgets. The FiSC database uses a standardized methodology to make cities comparable despite these differences in political structures. In addition, the Lincoln Institute's Significant Features of the Property Tax database contains a wealth of data. We have used these other data to construct measures of effective property tax rates for different classes of property, indices of classification, and summaries of property tax limitations.

Our data sources are described in detail in the next section. We then move on to a description of the basic trends and patterns of the urban property tax, an explanation of the regressions used to probe these findings more carefully, and a discussion of some cities that might be able to accommodate increased property tax use. We eventually come back full circle, considering emerging trends and even a semi-speculative political economy.

Overview of the Data

Characterizing the state of the urban property tax requires examining data on property and sales tax revenue, intergovernmental transfers, land prices, and property tax laws and limitations. The data set used in this analysis was drawn from several sources.

DATA COLLECTION AND AGGREGATION

Our primary source of data was the Lincoln Institute of Land Policy's FiSC database, which collects information on the demographics and government finances of 112 large cities throughout the United States. Information obtained from the database included collections data on property taxes, sales taxes, own-source taxes, and intergovernmental transfers. This data set offers a number of attractive features. Whereas other data sources used in property tax analysis often measure local government finances at the state level, the FiSC database directly measures the behavior of municipal governments.

1. The database is available at *www.lincolninst.edu/subcenters/fiscally-standardized-cities/*.

The database carefully sorts out each jurisdiction's finances so that the cities' finances are directly comparable to one another. Since the responsibility of providing local public services to a particular area can fall on several types of governments, revenue and expenditure data collected from only one type of government (e.g., U.S. Census Bureau data on individual local governments) can be misleading when looking across urban areas. The FiSC database uses a methodology created by several property tax experts to circumvent this problem.

Revenue and expenditure data are obtained from the U.S. Census Bureau's Census of Government Finance and the Annual Survey of State and Local Government Finances. The FiSC database defines what government behavior is attributable to each city by taking activity from the cities themselves and combining it with an appropriate share of public activity from surrounding and overlapping counties, school districts, and special jurisdictions. As these data were central to our analysis, we quote extensively from the summary of the FiSC methodology provided by the Lincoln Institute of Land Policy (2014a).

> To create the fiscally standardized cities (FiSCs), revenues and expenditures for the city government are combined with a share from any overlying counties, school districts, and special districts. For counties, fiscal variables are allocated to the FiSC database based on the city's share of the county's population. For instance, if a city accounts for 20 percent of the county's population, 20 percent of the county government's revenues and expenditures are allocated to the FiSC.
>
> For each school district, fiscal variables are allocated to the FiSC based on the percentage of students in the school district who live in the central city. Thus, if 75 percent of students in a school district live in the city, 75 percent of that school district's revenues and expenditures are allocated to the FiSC. The number of students in each school district who live in the central city is estimated using geographic information system (GIS) analysis with information on the boundaries of cities and school districts from U.S. Census TIGER shape files and data on school district enrollment at the census block group or tract level for the 1980–2010 period.
>
> For special districts, a two-pronged approach was used to develop the FiSC estimates. First, a Web search was used to determine the rough service area for more than 400 special districts. These special districts included the largest districts in terms of revenues and spending, all housing authorities serving FiSCs, and some selected smaller districts. Fiscal variables were allocated to each FiSC based on the city's share of population in each special district's service area. Although this Web search verified the service area for only about 10 percent of the special districts that are assumed to serve FiSCs, because of their large size these districts account for about 90 percent of special district expenditures allocated to FiSCs.
>
> Second, revenues and expenditures for smaller special districts were allocated to the FiSCs based on the type of special district. For example, airports, seaports, and transit utilities typically serve an entire metropolitan

> area, so fiscal variables were allocated based on the city's share of the metropolitan area population. Hospital districts, library districts, and park districts typically serve a county or smaller geographic area, so allocations were based on the city's share of the county population. Fire districts and certain types of utilities largely serve small municipalities or unincorporated areas; since they almost never serve the cities in the FiSC sample, no revenues or expenditures were allocated to the FiSCs. . . .
>
> It is important to note that the FiSC methodology provides an approximation of local government revenues and expenditures for central city residents and businesses. Determining the precise level of local government revenues and expenditures within city boundaries is far more complicated, and virtually impossible to do for 112 cities over the 34 years included in the FiSC database. For example, it would be more accurate to allocate property tax revenues based on the geographic distribution of property values rather than using the [per-person and per-student allocations]. There is, however, no central source for data on property tax bases at the city, school district, or county level. These data would be needed to allocate property taxes for overlying governments that cross city lines. While particular city areas may have distributions of revenue bases (property in particular) and expenditures that depart from the spatially uniform assumption used for the FiSC estimates, there is no reason to believe that these assumptions would lead to a systematic over- or underassignment of revenues or expenditures to central cities. (Lincoln Institute of Land Policy 2014a)

We obtained two sets of land values from the Lincoln Institute's Land and Property Values in the U.S. database (Lincoln Institute for Land Policy 2014b). Land values at the state level, developed by Davis and Palumbo (2007), are available for all the observations taken from the FiSC database. While the state-level data provide complete coverage, these data use a larger measure of information than the other city-level information in the database. Therefore, we supplemented these data with Metro Area Land Price information, provided by Davis and Heathcote (2007), which is available for 46 of the cities in the database (Lincoln Institute for Land Policy 2014c). Both sets of land values were calculated by subtracting the cost of the housing structure from the overall home value.

We used data from several sources to establish comprehensive information on the tax laws in effect for each of the observations in our data set. Information on state property tax laws was taken from Lincoln's Significant Features of the Property Tax database.[2] These data are available for every state and year from 2006 to 2012 and include details on tax rates, limitations, and exemptions across localities.

Property tax limitations are legal restrictions on the assessment and collection of levies on property. The popularity of property tax limitations has increased in recent decades in response to complaints regarding the equity and

2. The database is available at *www.lincolninst.edu/subcenters/fiscally-standardized-cities/*.

Table 5.1
Types of Property Tax Limitations

Limitation	Definition	Example
Tax rate	Restricts the rate at which property may be taxed, normally through a maximum percentage.	In a state with a 5% tax rate limitation, the owner of a house valued at $100,000 may pay no more than $5,000 in property taxes.
Assessment	Restricts the annual increase in the assessed value of a particular property.	In a state with a 5% assessment limitation, a property that was valued at $100,000 in year 1 may not have an assessed value of more than $105,000 in year 2, even if the market value exceeds that amount.
Revenue	Limits the amount of revenue that a government may collect from property taxes.	In a state with a 5% revenue limitation, a government that collected $100 million in property taxes in year 1 may not collect more than $105 million in year 2, even if property values and tax rates allow for further collections.
Local	Limits the effective property tax rates within a specific local jurisdiction (county, municipality, school district, etc.).	A local limitation may restrict the amount of property taxes collected in a given school district to 3% of total property values, or it may cap the growth in property revenues at 6% within a given county.

Source: Haveman and Sexton (2008).

fairness of these levies.[3] This research identifies four major types of property tax limitations: tax rate, assessment, revenue, and local (table 5.1).[4] Tax rate limitations set a maximum rate at which property may be taxed, normally in terms of a percentage of a property's overall value. Assessment limitations restrict the increase in valuation that a property may undergo over a period of time. Such limitations are normally expressed either as a percentage or in relation to inflation levels. Revenue limitations restrict the amount that property tax receipts may increase in a given year. These restrictions may or may not be linked to population and inflation levels. While these three limitations are typically imposed at the state level, local limitations, also called levy limitations, are imposed on smaller

3. See Haveman and Sexton (2008) for a detailed description of property tax limitations and Vigdor (2004) for a discussion of possible motivations behind such restrictions. Sheffrin (2013) provides some psychological foundations for these limitations.

4. Subsequent definitions of tax rate, assessment, and revenue limitations are similar to the terms described in Anderson (2006). Our description of local limitations mirrors the term as defined in Haveman and Sexton (2008).

jurisdictions—counties, municipalities, school districts, or special districts—and might place limits on the rates or revenue that these governments may assess.

The other major way to limit property tax collections is through the establishment of preferential tax rates for certain types of property. Governments that seek to attract specific types of real estate investment may lower the tax rates imposed on those types of property. For example, a city may lower its commercial property tax to increase its business presence. Alternatively, voters may want higher rates on commercial property to reduce their own share of taxation. Preferential tax rates may also be imposed to increase the fairness of the tax system. Seniors and military veterans, for example, are granted preferential property tax rates in several states. Property taxes also may be waived for certain segments of the population; these are called property tax exemptions.

Classification of property—that is, different ratios of assessed value subject to taxation to assessor-determined market value—is one way to change the tax burden across different types of property. Consider a town that taxes residential property at 50 percent of assessed value but commercial property at 100 percent of assessed value. The residential-to-commercial ratio would be 0.5 in this jurisdiction.

In addition to the residential-to-commercial ratio, we also used measures of effective tax rates, which take into account both differences in the classification of property and the ratio of actual market value to assessor-determined value for different types of property (along with any differences in nominal tax rates). (The effective tax rate is essentially the ratio of taxes to true market value.) In addition, we used the effective tax rate data provided by the "50 State Property Tax Study 2012," a joint venture of the Lincoln Institute of Land Policy and Minnesota Center for Fiscal Excellence (2013). Finally, we obtained data on local and state revenues by tax source from Census of Governments data, which derived the information from U.S Census Bureau reports. These data were used to conduct various state and local sensitivity checks on the results of our empirical analysis.

Additional measures of economic and demographic composition for each of our observations were included to account for other sources of variation across cities. The percentage of all inhabitants in the general metro area who are employed, as provided by the Bureau of Labor Statistics (2014), was the first variable. There were several reasons for using this variable. First, it is a simple and easily available measure that might be related to a city's tax base. City officials should be concerned about the effects of their actions on the local tax base. Second, cities with a relatively smaller labor force may have fewer resources or increased demands for education expenditures. Depending on the political dynamics, these factors could lead to either higher or lower property taxation.

The second variable measured the ratio of revenues raised by the city government to those raised in the FiSC. This factor was included to capture the level of political centralization in a given locality, with higher values representing more consolidated urban political systems. While the FiSC provides a nice measure

of the actual underlying fiscal activities in a locality, by design it does not map onto the political structure of the locality. In principle, the political structure of a locality may matter. For example, more-centralized political systems may find it more difficult to raise property taxes, because their actions may be more salient to voters. If there are independent political factors that affect the property tax share in a city, this variable can potentially capture them.

VARIABLE CONSTRUCTION

The share of property taxes as a percentage of own-source tax revenue was used to test for the determinants of tax receipts across localities in a given time period. Own-source tax revenue refers to all taxes that are levied by the city government, which include property taxes, general sales taxes, and special excise taxes on products such as cigarettes or alcohol. Importantly, this excludes intergovernmental transfers, which might fluctuate as a result of factors such as business cycles and thus skew our results. The measure of own-source revenue used here does not include fees, although a separate analysis uses a measure with fees used in the base.

We also calculated the shares for two other variables, intergovernmental transfers and sales tax revenue, for use as independent variables in the regression analysis. Intergovernmental transfers were measured as a percentage of own-source revenue in order to test for how these collections may vary with property tax levels. Own-source revenue was calculated for this variable in the same way as it was for the property tax share measure.

We followed a different procedure to calculate the sales tax revenue. Both property and sales taxes are included in the own-source revenue definition used as the denominator of the other share variables. However, including property tax receipts in the denominator for a sales tax measure would make such a measure inherently endogenous in our framework. Since property and sales taxes are the two largest sources of revenue for local governments, a city with a higher share of property tax revenue will, all else being equal, have a smaller portion of sales tax revenue, since the share available for other taxes will be relatively smaller in this instance. Use of the same own-source revenue measurement would, therefore, negatively bias the coefficient of regressions with this sales tax variable. The sales tax share was thus taken as a percentage of own-source revenue excluding property tax receipts for all subsequent empirical work.

It is difficult to find simple empirical measures for tax limitations, as they are typically quite complex. For example, what is the best way to numerically express the difference between (1) an assessment limit tied to the lesser of 3 percent or the growth through inflation; and (2) a local limitation that restricts the property tax rate in a school district to a total of 5 percent? We decided to capture the effects of tax limitations on property tax share with a series of indicator variables. We constructed indicator variables for each of the four types of tax limitations in table 5.1 (tax rate, assessment, revenue, and local). Additionally, we explored interactive indicator variables as well when there were multiple limits.

We constructed two types of effective tax rates using the 2012 effective tax rate data from the Lincoln Institute of Land Policy and Minnesota Center for Fiscal Excellence (2013). The first ratio compared the effective tax rates imposed on homestead and business property. This variable was intended to capture how relative exemptions to businesses and homeowners changed relative property tax receipt levels. The second ratio compared the effective tax rates applied to apartment and homestead dwellings and sought to capture the effect of exemptions applied within types of residential property.

In addition to using the land value data, we also indexed land values within observations to the first year of the study. The raw land data were helpful in trying to explain variations in property taxes across urban areas in a given time period. The within-city indexed prices were used to capture the determinants of changes in property tax collections over time in a given urban area. Finally, we assigned each city a regional indicator variable equivalent to one of those used by the U.S. Census Bureau: Northeast, South, Midwest, and West.

Descriptive Analysis

What do urban property taxes look like today compared with those in the past? Table 5.2 displays the summary statistics for property tax shares measured at the local and state levels. Property tax receipts as a share of own-source revenue dropped significantly from 1977 to the mid-1980s, most likely in response to a series of tax limitations that were introduced in several states during this time period.[5] Since that time, however, the property tax share has been relatively stable regardless of the unit of measure, with averages ranging from 39 and 41 percent at the local level in 1985–2010 and 42 and 45 percent at the state level in 1992–2010. The standard deviation of these observations also has remained relatively constant at between 11 and 13 percent of own-source revenue, indicating that the lack of movement in the means is not suggestive of any dispersion in the rates across observations.

Table 5.2 also contains summaries of land value information in constant dollars. The mean of land value observations exhibited much more fluctuation over time than did the mean of property tax shares, increasing by more than 35 percent at the local level between 1985 and 2002 before falling in 2010. State land value observations displayed even more variation, as the 2002 mean was nearly three times that in 1977. The variance of these observations also increased over time, more than doubling from 1985 to 2010 at both the state and local levels. This information suggests that land values have increased relative to other goods over time, but also that these measures are highly sensitive to the effects of business cycles. That property tax shares have remained relatively constant despite

5. One of these property tax limitations was Proposition 13, passed in California in 1978. For a detailed description of this limitation and others, see Haveman and Sexton (2008).

Table 5.2
Property Tax Share and Land Value Summary Statistics, 1977–2010

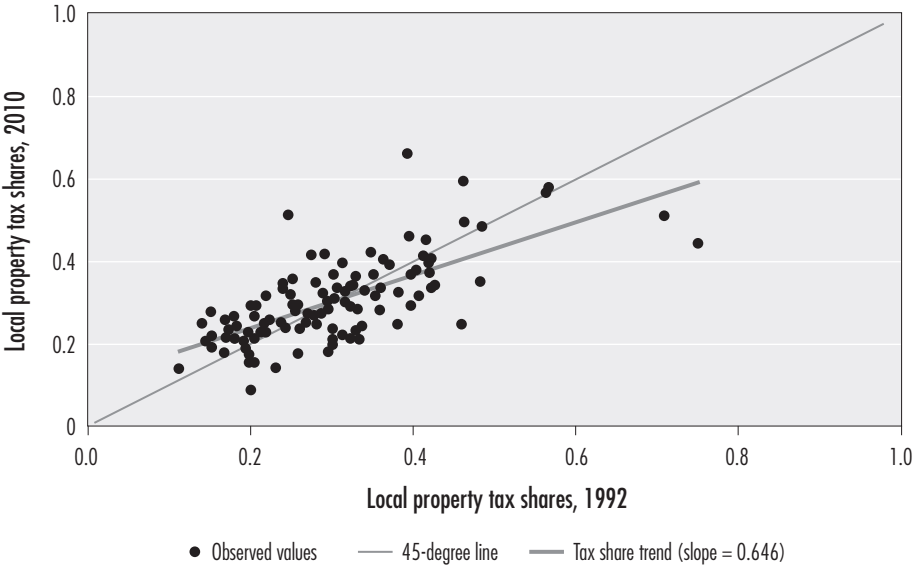
Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Local property tax share					
1977	112	52.4%	14.0%	18.6%	90.9%
1985	112	38.5%	12.3%	16.9%	79.7%
1992	112	41.0%	12.9%	15.0%	85.3%
2002	112	38.9%	12.9%	16.2%	79.2%
2010	112	41.2%	12.1%	15.8%	78.2%
State property tax share					
1992	114	43.7%	12.8%	11.2%	85.9%
2002	114	42.2%	11.8%	12.4%	83.8%
2010	114	44.8%	11.2%	20.8%	85.5%
Local land value					
1985	46	$108,697	$38,424	$57,797	$244,809
1992	46	$116,217	$57,218	$50,548	$317,608
2002	46	$147,116	$89,425	$58,007	$487,948
2010	46	$137,917	$83,594	$51,353	$409,994
State land value					
1977	114	$9,588	$11,768	$1,283	$34,552
1985	114	$11,585	$14,056	$1,345	$39,782
1992	114	$16,915	$22,589	$1,320	$65,603
2002	114	$26,546	$30,919	$2,488	$91,409
2010	114	$19,623	$25,021	$1,964	$136,933

Notes: "Local" and "state" imply measurement at the city and state level, respectively. State measurements are identical across cities in the same state. Local land values are in constant 1985 dollars; state land values are in constant 1977 dollars.
Source: Lincoln Institute of Land Policy (2014a, 2014b, 2014c).

the variance in land prices indicates that property taxes are no more or less variable than other local government revenue sources.

While table 5.2 examines the general time trends of urban property tax shares across all observations, figure 5.1 and table 5.3 track the observation-specific patterns of city property taxes. Figure 5.1 plots the local property tax shares of all cities in 1977 against those in 2010. Although the mean of the local shares differs by more than 10 percent across this time period, the scatterplot does not show any tendency for that change to be more dramatic across property tax receipt levels in either year. Overall, the time trend of the observations is strongly linear and not quite at the 45-degree line, which is consistent with the

Figure 5.1
Local Property Tax Shares, 1992 and 2010



Source: Lincoln Institute of Land Policy (2014a).

data in table 5.2 that indicate a gradual decline in property tax shares after 1977 but a relatively steady and small level of variance at a given cross-section.

Table 5.3 is a mobility matrix for local property tax observations in 1992 and 2010, where the shares are grouped by quintile to focus on more significant movements across this time period. Again there is evidence of significant "stickiness" in share values, as more than 45 percent of observations were located in the same quintile in both 1992 and 2010. The cities that displayed interquartile movement typically underwent modest shifts: 70 percent of cities located in different quintile bins in 1992 and 2010 shifted only one quintile, and no city moved either three or four quintiles.

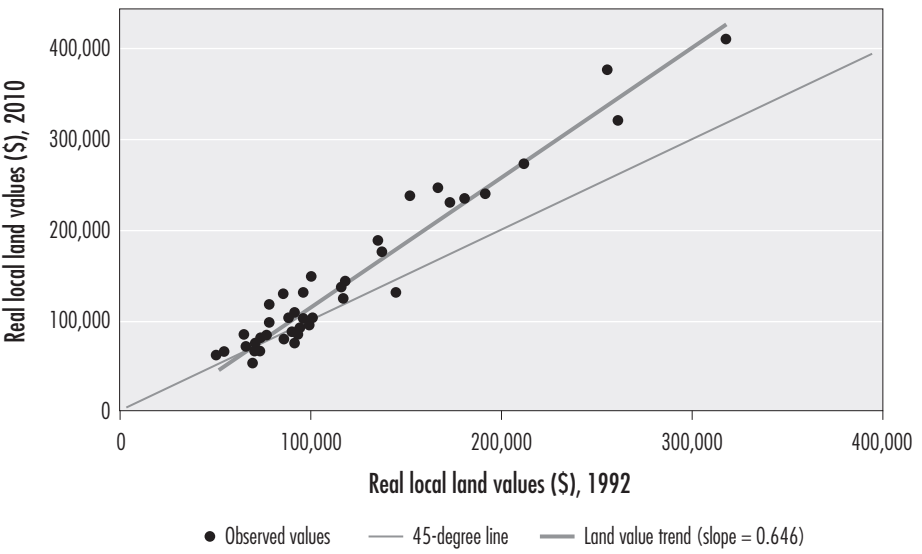
The summary statistics in table 5.2 indicate much more movement over time in the mean and variance of real land values than in those for property tax shares. Was this movement confined to a small set of observations, or was it characteristic of urban cities across the United States? Figure 5.2 maps the changes in local land values from 1992 to 2010 to help characterize these changes. The figure shows that just as with property tax shares, past local land values are highly predictive of present values for a given city. Cities on the lower or higher ends of the land value spectrum in 1985 were likely to occupy the same region in 2010. Moreover, there is an easily definable grouping of observations in both cross-sections.

Table 5.3
Mobility Matrix for Local Property Tax Observations, 1992 and 2010

	2010					
1992	Low Quintile	Second Quintile	Middle Quintile	Fourth Quintile	High Quintile	Total
Low Quintile	13	6	3	0	0	22
Second Quintile	6	8	5	3	0	22
Middle Quintile	3	5	6	5	3	22
Fourth Quintile	0	4	6	9	4	23
High Quintile	0	0	2	6	15	23
Total	22	23	22	23	22	112

Notes: Low quintile = cities with property tax share in the 0–20th percentiles; second quintile = 21st–40th percentiles; middle quintile = 41st–60th percentiles; fourth quintile = 61st–80th percentiles; high quintile = 81st–100th percentiles.
Source: Lincoln Institute of Land Policy (2014a).

Figure 5.2
Real Local Land Values, 1992 and 2010



Source: Lincoln Institute of Land Policy (2014b).

Table 5.4
Population of Cities in Sample by FiSC Category, 1992 and 2010

Year	Characteristic	Small	Medium	Large	Total
1992	Number	38	38	36	112
	Mean (thousands)	174	298	1,002	486
	Standard deviation (thousands)	20	63	127	805
	Typical observation	Modesto, CA	Mesa, AZ	San Antonio, TX	Denver, CO
2010	Number	37	38	37	112
	Mean (thousands)	186	331	1,113	546
	Standard deviation (thousands)	33	63	136	879
	Typical observation	Columbus, GA	Tampa, FL	Dallas, TX	Albuquerque, NM

Notes: Small = cities with population 200,000 or less in 1992 and 230,000 in 2010; medium = population more than 200,000 in 1992 and 230,000 in 2010 and 400,000 or less in 1992 and 450,000 in 2010; large = population more than 400,000 in 1992 and 450,000 in 2010. "Typical observation" is the city with the population closest to the mean in the given time period.
Source: Lincoln Institute of Land Policy (2014a).

With the exception of a few cities that displayed high land values in both years, the majority of observations were tightly clustered around land values of about $100,000 in 1992 and 2010.

Table 5.4 summarizes the population sizes of the cities in our sample in 1992 and 2010. The average city grew by about 60,000 people over these two decades, from 486,000 to 546,000 occupants. To provide further detail on how population size impacts other characteristics of these cities, observations are split into three roughly equal categories—small, medium, and large cities. Overall, the standard deviation of each set of observations roughly doubled moving from category to category.

The observations in each time period were ranked by their overall property tax shares and sorted into quintile categories in order to show how observations with high property tax shares differed from those with lower property tax shares. Tables 5.5 and 5.6 list the location, local property tax share, region, and size category of each observation in the highest and lowest property tax share quintiles, respectively.

Table 5.5 contains the descriptive characteristics of the highest property tax share quintile. The average property tax share was 60 percent in both 1992 and 2010, signaling that the lack of movement in mean property tax share values did not obfuscate any significant movement in this group of observations. Notably, the cities in table 5.5 were slightly more likely to have smaller populations in both years: twelve small, three medium, and seven large cities in 1992, and ten small, seven medium, and five large cities in 2010. Cities located in the West are underrepresented in this group, with only one entry in each year. Among

Table 5.5
Local Property Tax Shares of Highest-Value Cities, 1992 and 2010

1992						2010					
Rank	City	State	Share (%)	Region	Size	Rank	City	State	Share (%)	Region	Size
1	Warren	MI	85	MW	SM	1	Springfield	MA	78	NE	SM
2	Providence	RI	82	NE	SM	2	Boston	MA	73	NE	LG
3	Worcester	MA	71	NE	SM	3	Worcester	MA	72	NE	SM
4	Madison	WI	70	MW	SM	4	Madison	WI	70	MW	SM
5	Gary	IN	64	MW	SM	5	Providence	RI	67	NE	SM
6	Jackson	MS	62	SO	SM	6	Anchorage	AK	65	WE	MD
7	Indianapolis	IN	62	MW	LG	7	Jackson	MS	65	SO	SM
8	Boston	MA	62	NE	LG	8	Gary	IN	64	MW	SM
9	Arlington	TX	59	SO	MD	9	Warren	MI	61	MW	SM
10	Des Moines	IA	58	MW	SM	10	Durham	NC	58	SO	SM
11	Milwaukee	WI	58	MW	LG	11	Fort Wayne	IN	57	MW	MD
12	Fort Wayne	IN	57	MW	MD	12	Austin	TX	55	SO	LG
13	Springfield	MA	56	NE	SM	13	Fort Worth	TX	54	SO	LG
14	Portland	OR	55	WE	LG	14	Des Moines	IA	54	MW	SM
15	Fort Worth	TX	54	SO	LG	15	Milwaukee	WI	53	MW	LG
16	Omaha	NE	54	MW	MD	16	Virginia Beach	VA	53	SO	MD
17	Durham	NC	53	SO	SM	17	Lincoln	NE	52	MW	MD
18	Chesapeake	VA	53	SO	SM	18	Raleigh	NC	52	SO	MD
19	Greensboro	NC	53	SO	SM	19	Chesapeake	VA	52	SO	SM
20	Columbus	GA	53	SO	SM	20	Corpus Christi	TX	52	SO	MD
21	Dallas	TX	51	SO	LG	21	Houston	TX	52	SO	LG
22	Baltimore	MD	50	SO	LG	22	Greensboro	NC	51	SO	MD

Notes: Small = cities with population 200,000 or less in 1992 and 230,000 in 2010; medium = population more than 200,000 in 1992 and 230,000 in 2010 and 400,000 or less in 1992 and 450,000 in 2010; large = population more than 400,000 in 1992 and 450,000 in 2010. NE = Northeast; MW = Midwest; SO = South; WE = West; SM = small; MD = medium; LG = large.
Source: Lincoln Institute of Land Policy (2014a).

other things, this may be due to the increased number of tax limitations present in that region, including Proposition 13 in California and the Taxpayer Bill of Rights (TABOR) in Colorado. No other obvious regional patterns are evident in table 5.5. Although southern cities appear to have an above-average representation, this is likely the result of the large number of southern cities in the FiSC database.

Table 5.6
Local Property Tax Shares of Lowest-Value Cities, 1992 and 2010

1992						2010					
Rank	City	State	Share (%)	Region	Size	Rank	City	State	Share (%)	Region	Size
1	Mobile	AL	15	SO	SM	1	Flint	MI	16	MW	SM
2	Montgomery	AL	18	SO	SM	2	Mobile	AL	18	SO	SM
3	Baton Rouge	LA	21	SO	MD	3	Philadelphia	PA	20	NE	LG
4	Birmingham	AL	21	SO	MD	4	Colorado Springs	CO	23	WE	MD
5	Tulsa	OK	21	SO	MD	5	Denver	CO	24	WE	LG
6	Albuquerque	NM	23	WE	MD	6	St. Louis	MO	24	MW	MD
7	Oklahoma City	OK	24	SO	LG	7	Birmingham	AL	24	SO	SM
8	Louisville	KY	24	MW	MD	8	Montgomery	AL	25	SO	SM
9	St. Louis	MO	26	MW	MD	9	Cleveland	OH	25	MW	MD
10	Stockton	CA	26	WE	MD	10	Long Beach	CA	27	WE	LG
11	Philadelphia	PA	26	NE	LG	11	Little Rock	AR	28	SO	SM
12	Sacramento	CA	26	WE	LG	12	New Orleans	LA	28	SO	MD
13	Lexington	KY	26	MW	MD	13	Baton Rouge	LA	29	SO	MD
14	New Orleans	LA	27	SO	LG	14	Washington	DC	29	NE	LG
15	Spokane	WA	27	WE	SM	15	Chattanooga	TN	29	SO	SM
16	Chattanooga	TN	27	SO	SM	16	Charlotte	NC	29	SO	LG
17	Dayton	OH	27	MW	SM	17	Oklahoma City	OK	29	SO	LG
18	Modesto	CA	28	WE	SM	18	Dayton	OH	30	MW	SM
19	Seattle	WA	28	WE	LG	19	Buffalo	NY	30	NE	MD
20	Las Vegas	NV	28	WE	MD	20	Seattle	WA	30	WE	LG
21	Denver	CO	28	WE	LG	21	Spokane	WA	30	WE	SM
22	Kansas City	MO	29	MW	LG	22	Tacoma	WA	31	WE	SM

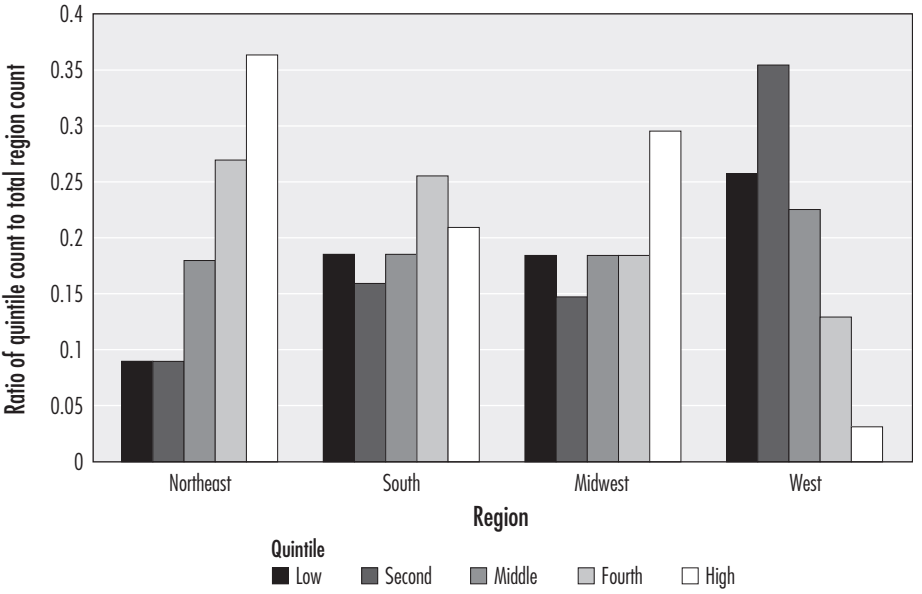
Notes: Small = cities with population 200,000 or less in 1992 and 230,000 in 2010; medium = population more than 200,000 in 1992 and 230,000 in 2010 and 400,000 or less in 1992 and 450,000 in 2010; large = population more than 400,000 in 1992 and 450,000 in 2010. NE = Northeast; MW = Midwest; SO = South; WE = West; SM = small; MD = medium; LG = large.
Source: Lincoln Institute of Land Policy (2014a).

Table 5.6 shows that the mean property tax share value in the lowest quintile also remained relatively steady over time, moving from 25 percent in 1992 to 26 percent in 2010. The lowest property tax share quintile does not exhibit any obvious tendencies by size (as were present in table 5.5); between six and nine observations in each size category are present in this quintile in both years.

Whereas cities in the West are underrepresented in table 5.5, their presence in table 5.6 is larger than their relative sampling would predict. This is consistent with the argument that property tax limitations have reduced tax revenues in the area. The nominal movement of shares by rank in both tables is very small, save for a small decrease in the tax receipts of cities with the very highest shares in table 5.5. Finally, both quintiles display significant levels of stickiness. Of the 22 observations in each group, 15 were present in the highest quintile in both years, and 13 were present in the lowest quintile in both years.

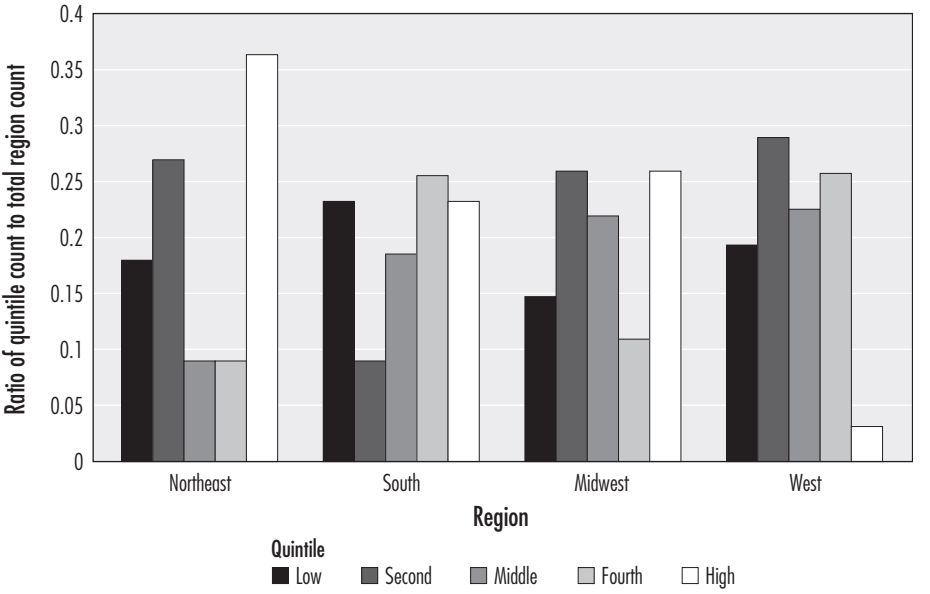
Figures 5.3 and 5.4 focus on the regional distinctions between property tax shares, tracking the within-region presence in each quintile for the Northeast, South, Midwest, and West in 1992 and 2010, respectively. Figure 5.3 displays strong tendencies toward high property tax shares in the Northeast in 1992, as observations in this region were more than three times as likely to be in the highest quintile as they were in either of the lowest two quintiles. Conversely, cities in the West skewed toward much lower property tax shares, with nearly 80 percent of these observations falling in the bottom three quintiles. The Midwest showed a slight tendency toward higher values, although it was not as pronounced as the trend in the Northeast. Observations in the South were spread relatively evenly across the quintiles.

Figure 5.3
Local Property Share Quintile Spread by Region, 1992



Source: Lincoln Institute of Land Policy (2014a).

Figure 5.4
Local Property Share Quintile Spread by Region, 2010



Source: Lincoln Institute of Land Policy (2014a).

The same analysis conducted for 2010 (figure 5.4) showed a few differences from 1992 (figure 5.3). While cities in the Northeast were still more likely than average to appear in the highest quintile, much of the concentration present in the middle and fourth quintiles in this region in 1992 shifted to the lowest two quintiles in 2010, which leaves the region with no clear property tax trend. Similarly, although western cities remained much less likely to have property tax shares in the highest two quintiles, the spread of observations in the other three quintiles in 2010 was much more even than it was in 1992. As in 1992, the 2010 observations in the South and Midwest showed no obvious trends in quintile distributions.

Table 5.7 provides a summary of property tax limitations by state for 2010.[6] Overall, there were 13 states with some form of tax rate limitation; 30 states with a local limitation; 37 states with an assessment limitation; and 13 states with a revenue limitation. All told, only five of the 50 states had none of the four property tax limitations written into law in 2010; three of these states were in the

6. This table is based on Haveman and Sexton (2008). A similar table for the year 2006 can be found in Anderson (2006).

Table 5.7
Property Tax Limitations by State, 2010

	Limitation					Limitation			
State	Tax Rate	Local	Assessment	Revenue	State	Tax Rate	Local	Assessment	Revenue
Alabama	Yes	Yes	No	No	Montana	No	Yes	Yes	No
Alaska	No	Yes	Yes	No	Nebraska	No	Yes	Yes	No
Arizona	Yes	No	Yes	Yes	Nevada	Yes	Yes	Yes	No
Arkansas	No	Yes	Yes	No	New Hampshire	No	No	No	No
California	Yes	No	No	Yes	New Jersey	No	No	Yes	No
Colorado	No	Yes	Yes	No	New Mexico	Yes	Yes	Yes	Yes
Connecticut	No	No	No	No	New York	No	Yes	No	Yes
Delaware	No	Yes	Yes	No	North Carolina	No	Yes	No	No
District of Columbia	Yes	No	Yes	Yes	North Dakota	No	Yes	Yes	No
Florida	No	Yes	No	Yes	Ohio	Yes	No	Yes	No
Georgia	No	Yes	No	Yes	Oklahoma	Yes	No	Yes	No
Hawaii	No	No	No	No	Oregon	Yes	No	Yes	No
Idaho	Yes	Yes	Yes	No	Pennsylvania	No	Yes	Yes	No
Illinois	No	Yes	Yes	No	Rhode Island	No	No	Yes	No
Indiana	No	No	Yes	No	South Carolina	No	No	Yes	Yes
Iowa	No	Yes	No	Yes	South Dakota	No	Yes	Yes	No
Kansas	No	No	Yes	No	Tennessee	No	No	No	No
Kentucky	No	Yes	Yes	No	Texas	No	Yes	Yes	Yes
Louisiana	No	Yes	Yes	No	Utah	No	Yes	Yes	No
Maine	No	No	Yes	Yes	Vermont	No	No	No	No
Maryland	No	No	No	Yes	Virginia	No	No	Yes	No
Massachusetts	No	Yes	Yes	No	Washington	Yes	Yes	Yes	No
Michigan	Yes	Yes	Yes	Yes	West Virginia	Yes	Yes	Yes	No
Minnesota	No	No	Yes	No	Wisconsin	No	Yes	Yes	No
Mississippi	No	No	Yes	No	Wyoming	No	Yes	No	No
Missouri	No	Yes	Yes	No					

Source: Lincoln Institute of Land Policy (2014a).

Northeast (Connecticut, New Hampshire, and Vermont), one was in the South (Tennessee), and one was in the West (Hawaii). Moreover, states with at least one property tax limitation were more likely than not to have multiple tax limitations; the average was more than two limitations per state. This factor highlights the importance of interactive limitation variables in the regression work that follows.

Table 5.8 summarizes the ratios of effective tax rates imposed on commercial, apartment, and homestead property in selected cities for the year 2012. Of these three types of property, homestead had the lowest tax rate and commercial had the highest: the average commercial-to-homestead ratio was 1.85, and the average apartment-to-homestead ratio was 1.49. Moreover, the variance among

Table 5.8
Ratios of Effective Tax Rates for Selected Cities, 2012

City	Commercial-to-Homestead	Apartment-to-Homestead	City	Commercial-to-Homestead	Apartment-to-Homestead
Anchorage, AK	1.069	1.069	Kansas City, MO	2.152	1
Birmingham, AL	2.105	2.105	Jackson, MS	1.754	1.754
Little Rock, AR	1.258	1.258	Charlotte, NC	1	1
Phoenix, AZ	2.566	1.214	Omaha, NE	1.01	1.01
Los Angeles, CA	1.024	1.024	Albuquerque, NM	1.082	1.041
Denver, CO	3.538	0.997	Las Vegas, NV	0.986	0.977
Washington, DC	2.412	1.243	Buffalo, NY	1.691	1.691
Jacksonville, FL	1.403	1.403	New York, NY	5.969	6.19
Atlanta, GA	2.507	2.507	Columbus, OH	1.346	1.346
Des Moines, IA	2.045	2.045	Oklahoma City, OK	1.067	1.067
Chicago, IL	2.96	1.15	Portland, OR	1	1.046
Indianapolis, IN	2.962	2.962	Philadelphia, PA	1.49	1.49
Wichita, KS	2.105	1.023	Providence, RI	2.305	2
Louisville, KY	0.956	0.956	Memphis, TN	1.6	1.6
New Orleans, LA	2.578	1.788	Houston, TX	1.255	1.337
Boston, MA	3.931	1.643	Salt Lake City, UT	1.849	1.017
Baltimore, MD	1.104	1.104	Virginia Beach, VA	0.956	0.956
Detroit, MI	1.258	1.265	Seattle, WA	1	1
Minneapolis, MN	2.007	1.434	Milwaukee, WI	1.034	1.032

Notes: The commercial-to-homestead ratio equals the effective tax rate on commercial properties divided by that on homestead properties. The apartment-to-homestead ratio equals the effective tax rate on apartment properties divided by that on homestead properties.
Source: Lincoln Institute of Land Policy and Minnesota Center for Fiscal Excellence (2013).

these values was relatively small, as the vast majority of ratios were between 1 and 3. The cities falling outside this range tended to be larger and have higher ratios: for instance, both ratios were about 6 in New York City. Finally, a number of jurisdictions taxed these types of property at the same rate.

Regression Analysis

The descriptive look at property tax shares in this study revealed considerable persistence and stickiness over time, both within and across observations. There are two different economic models that could deliver such results.

The first model assumes that local jurisdictions have the capacity to adjust their property tax shares over time. They may decide, for example, on their desired spending levels and then, taking into account their tax base, calculate the appropriate property tax rate. In Sheffrin (2013), this is called a *revenue-based property tax system*, in that property tax rates are adjusted primarily to meet revenue targets. One would expect adjustments to be slow, as the political system may restrict the speed with which property tax rates can be changed. From an econometric point of view, this would be best modeled as a traditional lagged adjustment model, with the lagged property tax share on the right-hand side of the equation along with the determinants of the desired property tax share. The speed of adjustment would be determined by the coefficient on the lagged property tax share, with coefficients closer to one indicating greater tax stickiness and therefore lower adjustment speeds. This finding would be consistent with the descriptive statistics found in this study.

The second model assumes that pervasive tax limitations (legal, political, or other) make it extremely difficult or even effectively impossible to change tax rates. California's Proposition 13 is an extreme example of this model at work. In this model, revenue from the property tax is tied to the property tax base. In Sheffrin (2013), this is called a *rate-based property tax system*. From an econometric standpoint, this would be best modeled by cross-sectional regressions that take into account characteristics such as the presence of property tax limitations and other relevant variables.

Results from both approaches are presented in this section. This study also examined a set of probit models in which the determinants of high- and low-property-tax-share cities were studied in the cross-section. These results did not differ from the cross-sectional analysis and are not reported here.

PARTIAL ADJUSTMENT MODELS

Table 5.9 presents the results of regressions on lagged property tax shares as well as regional effects. The lagged property tax values proved to be positive and significant, with an increasing effect on current levels as the time difference decreased. The coefficients of these variables were consistently just under one, indicating that observations tended to have relatively constant property tax values even when regional effects were accounted for. The lagged effects showed remarkable

Table 5.9
Lagged Linear Regressions on Local Property Tax Share: Part 1, 2010

	(1)	(2)	(3)	(4)	(5)	(6)
Local property tax share						
1977	0.541***					
	(7.404)					
1992		0.656***				
		(9.073)				
2002			0.800***			
			(13.90)			
State property tax share						
2002				0.734***		
				(6.898)		
2010					0.720***	0.637***
					(6.408)	(5.832)
Northeast dummy	0.0107	0.00658	–0.00982	–0.00905	–0.00316	0.00963
	(0.296)	(0.204)	(–0.407)	(–0.239)	(–0.0811)	(0.248)
South dummy	0.0643*	0.0457	0.0181	0.0709*	0.0573*	0.0385
	(2.492)	(1.986)	(1.050)	(2.645)	(2.085)	(1.470)
West dummy	–0.0228	0.0249	0.0266	0.0690*	0.0508	0.0334
	(–0.833)	(1.019)	(1.463)	(2.339)	(1.706)	(1.158)
Metropolitan statistical area (MSA) employment-to-population ratio, 2010	0.00121	0.000437	–0.00329	–0.00101	0.000943	
	(0.464)	(0.186)	(–1.828)	(–0.367)	(0.337)	
Actual-to-fiscalized-city-tax ratio, 2010	–0.00531	0.0314	0.0234	–0.0604	–0.0636	0.0244
	(–0.0994)	(0.652)	(0.654)	(–1.088)	(–1.108)	(0.454)
Constant	0.0272	0.0653	0.264*	0.137	0.0157	0.0886
	(0.166)	(0.448)	(2.436)	(0.820)	(0.0897)	(1.451)
Number of observations	64	64	64	64	64	110
Adjusted R^2	0.473	0.577	0.764	0.436	0.399	0.248

Note: T-statistics appear in parentheses.
*, **, *** = statistically significant at <0.05, <0.001, and <0.001 levels.
Source: Lincoln Institute of Land Policy (2014a, 2014b).

persistence, consistent with the data in figure 5.1. For example, in column 2 the coefficient on the 1992 local share is 0.656. Since this observation was 18 years from the dependent variable (2010 tax share), this indicates that the implied yearly coefficient in an autoregressive representation would be 0.976, only a 2.4 percent decay rate per year. Using the value in column 3 for the coefficient in 2002 (0.800) resulted in an almost identical result. State lagged property tax shares also have significant explanatory power, indicating that either statewide laws or state-specific characteristics drive city results.

The regional differences in table 5.9 were significant or close to significant in all specifications for the South dummy variables. The positive coefficients relate to how the property tax shares differed from those in the Midwest, which was the base case. This suggests that cities in the South have increased their property tax shares relative to cities in the Midwest in recent years. The presence of significant regional effects could stem from a couple of different factors. One potential explanatory factor is the regional profiles of other taxes: if cities in the South tend to have, say, lower sales taxes than those in other regions, they may increase revenue from other sources, including property taxes. Property tax limitations also may drive this result. These relationships were explored in later regressions.

An extensive analysis of the effects of land prices on property tax shares was conducted. None of the land price measures proved significant in any of the regressions. As the summary statistics indicate, property tax share remained relatively level, while land values increased, suggesting that this channel may not have been operating. The regressions confirmed this. In principle, a number of offsetting mechanisms could break the link between land values and property tax shares across cities. Neither the metropolitan statistical area (MSA) employment-to-population measures (available for a subset of cities) nor the actual-to-fiscalized-city-tax ratio variables were statistically significant or stable across our specifications. In principle, land prices, employment measures, and fiscal centralization could all affect property tax share, but no significant effects were found.

CROSS-SECTIONAL LINEAR REGRESSIONS

The cross-sectional analysis tested for the effect of regional variables, land values, and other taxes and grants on the variation of the 2010 property tax shares across observations. Unlike the regressions in the previous section, these regressions tested for the impact of tax limitations and classification ratios on the dependent variable.[7] Interactive variables for the tax limitation variables were included

7. Tax limitation variables were excluded from the previous section because the presence of limitations remained relatively constant over the time period for which data were available in this sample. Regressions to test for the effect of tax limitations and classification ratios on the dependent variable were performed, but the standard errors were too large to reveal anything meaningful about the underlying relationship. Since effective tax rates were available for only one time period, these variables also were excluded from the previous set of regressions.

to test for the presence of a nonlinear relationship between tax limitations and overall tax share.

In theory, property tax limitations inherently restrict the amount of money available to governments and should thus have a clear and negative impact on an observation's overall tax share, leading to negative coefficients for these variables. This hypothesis assumes that property tax limitations are effective in reducing such levies. In cross-sectional regressions, however, causal interpretations may be problematic. If limitations are in fact ineffective in reducing collections, the relationship between limitations and tax share may even be positive, since the presence of restrictions could serve as a signal that tax share was relatively high to begin with.

Tables 5.10a and 5.10b display the results of regressions that included both the variables in Table 5.9 and property tax limitations. These results show that tax rate limitations (typically imposed at the state level) significantly reduce urban property tax share, while local or levy limitations have a smaller but still notable effect in the same direction. Tax rate limitations, through a cap of the overall tax rate, perhaps represent the most direct form of property tax limitation, which is consistent with this type of restriction having the largest effect on property tax share. As local limitations can vary by type, as well as by the type of jurisdiction in which they are effective, it may be that the significant result for local limitations may vary across the states. Other tax limitations seem to have little or no effect on property tax share, although the fact that these limitation types are used less frequently makes it difficult to isolate their effects.

The local sales tax share had a consistently negative effect on the property tax share, while the intergovernmental transfer variable produced positive and significant coefficients. The negative effect on the sales tax share was not unexpected, but causal interpretations are difficult to disentangle. Do localities that willingly choose higher sales taxes also deliberately reduce their property tax share? Or do localities that are severely constrained through property tax limitations compensate by raising their sale taxes? The positive coefficient on the intergovernmental share is intriguing and does *not* suggest that increased intergovernmental grants allow localities to lower their property taxes. This would be the case if there were fixed revenue targets and intergovernmental grants were exogenous. One plausible explanation for the result in this study may be that states are willing to match individual cities' efforts to increase revenue in order to induce more fiscal effort from local governments. Thus, cities that increase property taxes may be able to count on additional matching support from the state. At the minimum, the results in this study suggest that there may be some complex political interactions between state governments and cities; as a consequence, we should be careful in interpreting causal results in a cross-section.

Tables 5.11a and 5.11b display the results of regressions with the independent variable set expanded to include both the limitation interactive variables and the effective tax rates. The impact of effective tax rates could potentially be in either direction. A positive effect would indicate that preferential treatment for

Table 5.10a
Linear Regressions on Local Property Tax Share: Part 2, 2010

	(1)	(2)	(3)	(4)	(5)	(6)
State land value, 2010	–6.75e-07 (–0.82)	–6.32e-07 (–0.79)	–6.60e-07 (–0.93)	–6.16e-07 (–0.90)	–1.08e-04 (–0.978)	
Percentage of state land growth, 1992–2010						–5.43e-05 (–0.66)
Northeast dummy	0.0547 (1.16)	0.00175 (0.03)	0.0950* (2.29)	0.0416 (0.95)	0.0710 (1.280)	0.0312 (0.73)
South dummy	–0.00104 (–0.03)	0.0114 (0.34)	0.0775* (2.37)	0.0903** (2.83)	0.0811 (1.663)	0.0873** (2.77)
West dummy	0.0204 (0.50)	0.0289 (0.72)	0.0703 (1.92)	0.0789* (2.23)	0.0690 (1.368)	0.0795* (2.16)
Tax rate limitation, 2010	–0.11*** (–3.57)	–0.13*** (–4.05)	–0.068* (–2.38)	–0.083** (–2.94)	–0.077 (–1.762)	–0.089** (–3.20)
Local limitation, 2010	–0.0629* (–2.36)	–0.0515 (–1.95)	–0.0296 (–1.24)	–0.0181 (–0.77)	–0.0507 (–1.406)	–0.00984 (–0.44)
Revenue limitation, 2010	0.0391 (1.36)	0.0390 (1.39)	0.0294 (1.18)	0.0293 (1.22)	0.0632 (1.787)	0.0311 (1.30)
Assessment limitation, 2010	0.0413 (1.58)	0.0367 (1.43)	0.000108 (0.00)	–0.00463 (–0.20)	0.0480 (1.299)	–0.0152 (–0.62)
Local intergovernmental share, 2010		0.103* (2.47)		0.104** (2.90)	0.0181 (0.269)	0.106** (2.93)
Local sales tax share, 2010			–0.75*** (–5.86)	–0.75*** (–6.09)	–0.346* (–2.504)	–0.77*** (–6.10)
Metropolitan statistical area (MSA) employment-to-population ratio, 2010					0.00118 (0.243)	
Actual-to-fiscalized-city-tax ratio, 2010					–0.0635 (–0.785)	
Constant	0.444*** (10.47)	0.374*** (7.45)	0.486*** (12.96)	0.416*** (9.53)	0.368 (1.142)	0.417*** (9.46)
Number of observations	112	112	112	112	64	112
Adjusted R^2	0.007	0.123	0.165	0.339	0.148	0.382

Note: T-statistics appear in parentheses.
*, **, *** = statistically significant at <0.05, <0.01, and <0.001 levels.
Source: Lincoln Institute of Land Policy (2014a).

Table 5.10b
Linear Regressions on Local Property Tax Share: Part 2, 2010

	(7)	(8)	(9)	(10)	(11)	(12)
Northeast dummy	0.0437	–0.00893	0.0842*	0.0313	0.0313	0.0647
	(0.97)	(–0.18)	(2.12)	(0.74)	(0.74)	(1.176)
South dummy	–0.00950	0.00357	0.0693*	0.0827**	0.0827**	0.0630
	(–0.29)	(0.11)	(2.20)	(2.69)	(2.69)	(1.397)
West dummy	0.0109	0.0200	0.0610	0.0703*	0.0703*	0.0484
	(0.28)	(0.52)	(1.73)	(2.06)	(2.06)	(1.057)
Tax rate limitation, 2010	–0.12***	–0.13***	–0.074*	–0.088**	–0.088**	–0.081
	(–3.83)	(–4.31)	(–2.62)	(–3.19)	(–3.19)	(–1.857)
Local limitation, 2010	–0.0562*	–0.0452	–0.0230	–0.0119	–0.0119	–0.0597
	(–2.22)	(–1.80)	(–1.01)	(–0.53)	(–0.53)	(–1.711)
Revenue limitation, 2010	0.0416	0.0414	0.0319	0.0316	0.0316	0.0599
	(1.46)	(1.49)	(1.29)	(1.32)	(1.32)	(1.703)
Assessment limitation, 2010	0.0367	0.0323	–0.00447	–0.00893	–0.00893	0.0639
	(1.44)	(1.30)	(–0.19)	(–0.40)	(–0.40)	(1.925)
Local intergovernmental share, 2010		0.104*		0.105**	0.105**	0.00839
		(2.49)		(2.93)	(2.93)	(0.126)
Local sales tax share, 2010			–0.75***	–0.75***	–0.75***	–0.307*
			(–5.87)	(–6.09)	(–6.09)	(–2.322)
Metropolitan statistical area (MSA) employment-to-population ratio, 2010						0.000144
						(0.0303)
Actual-to-fiscalized-city-tax ratio, 2010						–0.0513
						(–0.642)
Constant	0.441***	0.371***	0.483***	0.413***	0.413***	0.427
	(10.45)	(7.43)	(12.94)	(9.50)	(9.50)	(1.352)
Number of observations	112	112	112	112	112	64
Adjusted R^2	0.126	0.168	0.340	0.385	0.385	0.148

Note: T-statistics appear in parentheses.
*, **, *** = statistically significant at <0.05, <0.01, and <0.001 levels.
Source: Lincoln Institute of Land Policy (2014a).

homestead property increased property tax shares, signaling perhaps a reduced inelasticity on the part of businesses and apartment dwellers to mobilize in response to increased taxation; a negative effect would signal that relatively preferential policies for businesses led to higher property tax shares. Since assessment and revenue limitations proved insignificant in previous regressions, these factors were combined into a single "Other limitation" variable for this set of specifications.

The results of the regressions in tables 5.11a and 5.11b largely mirror those found in the earlier work. The tax limitation variables were again negative and significant for tax rate and local limitations and insignificant for all other factors, including the interactive items. The effective tax rate variables returned coefficients that were statistically insignificant and very close to zero, signaling that preferential treatment for a particular type of property does not result in

Table 5.11a
Dependent Variable: Local Property Tax Share, 2010

	(1)	(2)	(3)	(4)	(5)	(6)
State land value, 2010	–4.5 e-07	–1.0 e-06	–6.8 e-07	–7.0 e-07	–7.8 e-07	–7.8 e-07
	(–0.80)	(–1.66)	(–1.15)	(–1.19)	(–1.25)	(–1.197)
Northeast dummy	–0.00478	0.0627	0.00974	0.0106	0.00888	0.0775
	(–0.11)	(1.35)	(0.21)	(0.23)	(0.19)	(1.365)
South dummy	0.0528	0.0840*	0.0555	0.0596	0.0596	0.105*
	(1.66)	(2.53)	(1.74)	(1.78)	(1.78)	(2.431)
West dummy	0.0696	0.0466	0.0761	0.0759	0.0762	0.0859
	(1.82)	(1.16)	(1.98)	(1.97)	(1.97)	(1.833)
Local intergovernmental share, 2010	0.119**	0.0829*	0.111**	0.111**	0.112**	0.0254
	(3.06)	(2.01)	(2.82)	(2.81)	(2.82)	(0.382)
Local sales tax share, 2010	–0.364***	–0.394***	–0.349***	–0.343***	–0.346***	–0.352**
	(–3.94)	(–4.00)	(–3.76)	(–3.65)	(–3.65)	(–2.704)
Tax rate limitation, 2010	–0.107***		–0.114***	–0.112***	–0.102*	–0.0914
	(–3.78)		(–3.97)	(–3.88)	(–2.54)	(–1.755)
Local limitation, 2010		–0.0125	–0.0314	–0.0321	–0.0246	–0.0805
		(–0.49)	(–1.29)	(–1.31)	(–0.79)	(–1.821)
Other limitation, 2010				0.0158	0.0119	0.0906
				(0.42)	(0.31)	(1.596)
Tax rate–local limitation interactive, 2010					–0.02	0.0724
					(–0.39)	(1.122)

(continued)

Table 5.11a *(continued)*

	(1)	(2)	(3)	(4)	(5)	(6)
Metropolitan statistical area (MSA) employment-to-population ratio, 2010						0.00164 (0.397)
Actual-to-fiscalized-city-tax ratio, 2010						–0.0939 (–1.251)
Constant	0.422*** (12.09)	0.420*** (10.16)	0.446*** (11.37)	0.429*** (7.69)	0.427*** (7.61)	0.341 (1.170)
Number of observations	112	112	112	112	112	64
Adjusted R^2	0.252	0.151	0.257	0.251	0.245	0.127

Note: T-statistics appear in parentheses.
*, **, *** = statistically significant at <0.05, <0.01, and <0.001 levels.
Source: Lincoln Institute of Land Policy (2014a).

Table 5.11b
Dependent Variable: Local Property Tax Share, 2010

	(7)	(8)	(9)	(10)	(11)
State land value, 2010	–7.8 e-07 (–1.23)	–7.8 e-07 (–1.23)	–9.4 e-07 (–1.61)	–8.2 e-07 (–1.29)	–7.0 e-07 (–1.067)
Northeast dummy	0.0175 (0.38)	0.0175 (0.38)	0.053 (1.21)	0.0115 (0.25)	0.0733 (1.286)
South dummy	0.0598 (1.78)	0.0598 (1.78)	0.0769* (2.28)	0.043 (1.21)	0.110* (2.545)
West dummy	0.0736 (1.84)	0.0736 (1.84)	0.0441 (1.1)	0.0813* (2.02)	0.0827 (1.745)
Local intergovernmental share, 2010	0.105* (2.61)	0.105* (2.61)	0.0815* (1.98)	0.0919* (2.22)	0.0367 (0.546)
Local sales tax share, 2010	–0.320** (–3.26)	–0.320** (–3.26)	–0.378*** (–3.68)	–0.284** (–2.80)	–0.401** (–2.938)
Tax rate limitation, 2010	–0.202* (–1.99)	–0.109* (–2.62)		–0.166 (–1.59)	–0.0103 (–0.0643)
Local limitation, 2010	0.0543 (0.72)	0.0543 (0.72)		0.0356 (0.47)	–0.232 (–1.916)

(continued)

Table 5.11b *(continued)*

	(7)	(8)	(9)	(10)	(11)
Other limitation, 2010	0.0553 (0.87)	0.0553 (0.87)		0.0494 (0.78)	0.00504 (0.0609)
Tax rate–local limitation interactive, 2010	0.00373 (0.07)	–0.0892 (–0.97)		0.00703 (0.13)	0.0559 (0.825)
Tax rate–other limitation interactive, 2010	0.0929 (0.98)			0.0367 (0.36)	–0.0564 (–0.371)
Local–other limitation interactive, 2010	–0.0955 (–1.14)	–0.0955 (–1.14)		–0.0891 (–1.06)	0.180 (1.367)
All limitation interactive, 2010		0.0929 (0.98)			
Homestead-to-commercial assessment ratio, 2010			0.04 (0.69)	0.0895 (1.37)	
Homestead-to-apartment assessment ratio, 2010			0.02 (0.34)	–0.05 (0.73)	
Metropolitan statistical area (MSA) employment-to-population ratio, 2010					0.00283 (0.670)
Actual-to-fiscalized-city-tax ratio, 2010					–0.0854 (–1.120)
Constant	0.393*** (5.91)	0.393*** (5.91)	0.376*** (6.05)	0.338*** (4.35)	0.328 (1.123)
Number of observations	112	112	112	112	64
Adjusted R^2	0.242	0.242	0.153	0.248	0.129

Note: T-statistics appear in parentheses.
*, **, *** = statistically significant at <0.05, <0.01, and <0.001 levels.
Source: Lincoln Institute of Land Policy (2014a).

changes in overall property tax share. The effect of intergovernmental transfers was still positive, and the sales tax variable was again negative. Neither the MSA employment-to-population ratio nor the degree of fiscal centralization was statistically significant.

ALTERNATIVE SPECIFICATION: OWN-SOURCE REVENUE CALCULATION

All of the preceding empirical specifications used a measure of own-source revenue that included receipts from property taxes, sales taxes, individual income taxes, and corporate income taxes. However, the definition of own-source revenue

Table 5.12
Source Detail on the Definitions of Own-Source Revenue

Revenue Source	In "Main" Definition?	In "Fee" Definition?
Property taxes	Yes	Yes
General sales taxes	Yes	Yes
Selective sales taxes	Yes	Yes
Intergovernmental transfers	No	No
Individual income taxes	Yes	Yes
Corporate income taxes	Yes	Yes
Other taxes	No	Yes
Current user charges[a]	No	Yes
Miscellaneous fees[b]	No	Yes
Utilities[c]	No	No
Liquor store sales	No	No
Employee retirement trusts	No	No

[a]Includes charges devoted to education, healthcare, highways, transportation, natural resources, waste management, and parks and recreation.
[b]Includes fees on interest earnings and property sales; special assessments; and other general revenue fees.
[c]Includes water supply, electricity, gas supply, and transit.
Source: Lincoln Institute of Land Policy (2014a).

may vary. Specifically, the interpretation in this study excluded a number of user charges and fees that accrue to localities but that might be legislated by different levels of government. Such receipts could include charges devoted to education, healthcare, and transportation; fees on interest earnings and property sales; and special assessments. To ensure that the results were not driven by the exclusion of these variables, regressions were also run with a more inclusive definition of own-source revenue. Table 5.12 summarizes the differences between the "main" and "fee" definitions. Overall, the results with the more inclusive measure were strikingly similar to those presented here. There were only two minor differences. The coefficients on lagged property tax shares were slightly lower (around 0.50 as compared with 0.65 in table 5.9), and the coefficient on intergovernmental transfers was still positive but now carries statistical significance.

Conclusions

The empirical analysis demonstrated that property tax revenue share was not related to changes in land prices, but it was related to non–property tax revenue

and to tax rate and local limitations. Additionally, although we did not find any significant effects from our effective tax rate measures, it remains the case that increasing the relative taxation on business property is a potential source of additional revenue. These two factors were used to explore the potential scope of increased revenue for low-property-tax-share cities, which may have the greatest potential for revenue increases.

Table 5.13 displays the share percentage indicators for whether the cities with the 40 lowest property tax shares in our sample have preferential tax policies toward residential property and whether they have tax rate or local limitations. The "classification preferences" column identifies cities that impose *lower* tax rates on residential property than on commercial and other nonresidential property. Overall, 12 of the 40 cities have such preferences; this percentage is not significantly different from that in the entire sample, where 26 of the 112 cities have differential treatment.

Table 5.13 also indicates the presence of the two tax limitations that were significant in our regressions: tax rate and local limitations. Almost all of the cities in this table impose at least one property tax limitation (the only exceptions being Chattanooga, Tennessee; Kansas City, Missouri; and Norfolk, Virginia), while 10 impose both tax rate and local limitations. Only 13 of the 112 cities in the entire sample impose both types of limitations. Thus, although there might be some opportunity for increased revenue from changes in classification, virtually all of the lowest-property-tax cities face important statutory restrictions regarding increased property taxation.

With a relatively small fraction of cities classifying property, there is the potential for increased revenue by changing property tax statutes (and typically state constitutions) to allow for higher levels of taxation for, say, commercial and industrial property. In most cities, that would be a substantial portion of the property tax roll. In San Francisco, for example, the share of commercial and industrial property narrowly defined is about 30 percent, and other cities are likely to have similar percentages (California State Board of Equalization 2014). If large multifamily rental property and other non-single-family categories were included in a classification scheme, the percentages would rise.

The politics of classification can be treacherous, however. In California, reformers have sought unsuccessfully to date to remove the assessment increase limitations of Proposition 13 from commercial and industrial property and thus tax it at its true market value. Depending on the state of the property market at the time of a change, the increase in assessments could run anywhere from 15 to 35 percent in a typical urban county such as Los Angeles. Opponents have successfully portrayed this as an antibusiness maneuver and a wedge to initiate the erosion of the homeowner protections in Proposition 13. Other states with strong protections for homeowners, however, have managed to adopt classification schemes into their constitutions and tax commercial and industrial property at higher rates.

Another trend leading to more property tax revenue may be greater urban density. A story in the *Wall Street Journal* reported on the growing number of

Table 5.13
Tax Classification Preferences and Limitations of the Lowest-Value Cities, 2010

Rank	City	State	Property Tax Share (%)	Region	Size	Classification Preferences?	Limitations?
1	Flint	MI	9	MW	SM		††
2	Mobile	AL	14	SO	SM	*	††
3	Colorado Springs	CO	14	WE	MD	*	†
4	Denver	CO	15	WE	LG	*	†
5	Philadelphia	PA	15	NE	LG		†
6	Long Beach	CA	17	WE	LG		†
7	Cleveland	OH	18	MW	MD		†
8	Chattanooga	TN	18	SO	SM	*	
9	St. Louis	MO	18	MW	MD	*	†
10	Charlotte	NC	18	SO	LG		†
11	Birmingham	AL	19	SO	SM	*	††
12	Little Rock	AR	19	SO	SM		†
13	New Orleans	LA	20	SO	MD		†
14	Montgomery	AL	20	SO	SM	*	††
15	Dayton	OH	21	MW	SM		†
16	Spokane	WA	21	WE	SM		††
17	Buffalo	NY	21	NE	MD		†
18	Tacoma	WA	21	WE	SM		††
19	Seattle	WA	21	WE	LG		††
20	Oklahoma City	OK	21	SO	LG	*	†
21	Lubbock	TX	21	SO	SM		†
22	Syracuse	NY	21	NE	SM		†
23	Baton Rouge	LA	22	SO	MD		†
24	Detroit	MI	22	MW	LG		††
25	Kansas City	MO	23	MW	SM	*	
26	Oakland	CA	23	WE	MD		†
27	Pittsburgh	PA	23	NE	MD		†
28	Modesto	CA	23	WE	SM		†
29	Norfolk	VA	23	SO	MD		
30	Sacramento	CA	23	WE	LG		†
31	Salt Lake City	UT	24	WE	SM	*	†

(continued)

Table 5.13 *(continued)*

Rank	City	State	Property Tax Share (%)	Region	Size	Classification Preferences?	Limitations?
32	Washington	DC	24	NE	LG	*	†
33	Anaheim	CA	24	WE	MD		†
34	Toledo	OH	24	MW	MD		†
35	Las Vegas	NV	24	WE	LG		††
36	Grand Rapids	MI	24	MW	SM		††
37	Arlington	TX	25	SO	MD		†
38	Los Angeles	CA	25	WE	LG		†
39	Chicago	IL	25	MW	LG		†
40	Tulsa	OK	25	SO	MD	*	†

Notes: NE = Northeast; MW = Midwest; SO = South; WE = West; SM = small; MD = medium; LG = large.
* = city has preferential tax policies toward residential properties; † = city has tax rate limitations or local limitations; †† = city has both tax rate limitations and local limitations.
Source: Lincoln Institute of Land Policy (2014a).

high-rise buildings in Minneapolis, which some have called the "Manhattanization" of America (Dougherty 2014). To the extent that demographic changes lead to population growth in cities and greater density, the share of property tax revenue is likely to grow as well. However, even with this development, there are potential offsetting factors, such as abatements offered to owners to renovate older buildings or convert them to residential use. For example, while there has been a rise in new condo developments in underutilized buildings in downtown Brooklyn, New York, there has also been an extensive use of generous abatements, often extending for 20 years. These abatements typically offset virtually all increases in property tax bills. What the population influx giveth, the abatements taketh away.

In an earlier prognostication of the future of the property tax, Sheffrin (1998) opined that as equity considerations and lawsuits continued to centralize education finance at the state level, the local property tax would continue to lose favor, as voters cared more about education than for other uses of property tax revenue. Nonetheless, the property tax would persist and grow in dollar terms, if not in the share of own-source revenue. In fact, the property tax has a robust and largely immovable base, and other local taxes (e.g., sales taxes) face their own challenges. The current study essentially confirms these conjectures. Since the last great wave of property tax revolts in the late 1970s, property tax shares in urban settings simply have not changed very much. Tax limitations and homeowners' desire to protect themselves from tax increases place sharp limits on local authorities.

Increased use of classification schemes and greater density in urban areas may provide some avenues for increases in the property tax share of own-source revenue, but these channels face their own obstacles.

The stability in the property tax share indicates that property tax revenue has kept pace with overall revenue and with the substantial growth of cities over the past several decades. The current study does not suggest much potential for increasing its share of total revenue, however. In the event of greater expenditure requirements or revenue shortfalls, cities are more likely to turn to increased sales taxes, intergovernmental transfers, or user charges than to increased property taxes.

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COMMENTARY
John Yinger

The chapter by Grant Driessen and Steven M. Sheffrin provides perspective on the current use and likely future reliance on the property tax in large cities. It draws on the Lincoln Institute of Land Policy's Fiscally Standardized Cities (FiSC) database, which accounts for the complexities of the American federal system by cumulating tax information across all (or almost all) local governments within each city's boundaries. Thus, "reliance on the property tax" means reliance by the set of local governments that share space in a city. This is a valuable data set, and the study described in this chapter is a good use of it. Comparisons of local governments across states, and sometimes within states, are difficult because these governments are arranged so differently throughout the country. The FiSC database is one way to make meaningful comparisons.

To give some perspective on this chapter, it is important to point out that an alternative approach to comparing cities is available. In *America's Ailing Cities* (Ladd and Yinger 1991), Helen Ladd and I developed indices of city service responsibilities, service costs, and revenue-raising capacity to account for the role that each city played. These indices vary widely across cities, largely because the city is the main local government in some places, whereas the county is the main local government elsewhere. The Ladd/Yinger approach and the FiSC approach are complements, not substitutes, and Driessen and Sheffrin's chapter based on the FiSC data set makes a valuable contribution.

One general comment about the FiSC data set is that it might lead users to miss some key differences across cities. A small city in a large county, such as Syracuse, New York, might have different outcomes than a city/county with the same total own-source revenue. County areas outside some cities have a suburban character, for example, and therefore might need different services, face different costs, or provide different tax bases than the central city. Such differences across urban areas also might lead to differences in politics. Tax and spending choices might favor a city when it contains most of an area's population but work against a city when it is dwarfed by its suburbs. As discussed below, some of these issues might influence the property tax share as defined in this chapter.

Driessen and Sheffrin follow "an unabashedly empirical approach" to help explain the factors that influence a city's reliance on the property tax. (In the interest of conciseness, the rest of these comments use "city" to mean the set of governments that operate within a city's boundaries, as in the FiSC data set.) More specifically, they estimate a series of regressions to explore the determinants of property tax revenue. It is difficult to interpret most of their regressions, however, because the conceptual framework provided in the chapter is limited. My comments build on two such frameworks to help me make sense of things.

To be fair, Driessen and Sheffrin use two "economic models" to explain a city's reliance on the property tax. As they put it, "The first model assumes that

local jurisdictions have the capacity to adjust their property tax shares over time." They implement this approach using "a traditional lagged adjustment model, with the lagged property tax share on the right-hand side of the equation along with the determinants of the desired property tax share." Their "second model assumes that pervasive tax limitations (legal, political, or other) make it extremely difficult or even effectively impossible to change tax rates." They implement this model using "cross-sectional regressions that take into account characteristics such as the presence of property tax limitations and other relevant variables." In this commentary, these models are referred to as model 1 and model 2.

The first framework that seems useful to me is an accounting framework,

σ = revenue share
t = tax rate
where B = tax base
R = revenue
ε = elasticity of B with respect to t

The following subscripts identify the different types of taxes:

P = property tax
S = sales tax
O = other revenue source
T = total

The property tax share can then be written as

$$\sigma_P = \frac{R_P}{R_T} = \frac{t_P B_P}{t_P B_P + t_S B_S + R_O}$$

and the percentage change in this share is as follows, where d indicates a change:

$$\frac{d\sigma_P}{\sigma_P} = (1-\sigma_P)\left(\frac{dt_P}{t_P}(1+\varepsilon_P) + \frac{dB_P}{B_P}\right) - \sigma_S\left(\frac{dt_S}{t_S}(1+\varepsilon_S) + \frac{dB_S}{B_S}\right) - \sigma_O\left(\frac{dR_O}{R_O}\right)$$

This framework suggests several lessons that might be helpful in understanding the role of the property tax. First, the property tax share depends on changes in both the property tax rate and the property tax base. In principle, rate changes are policy choices, but they might be severely constrained, especially with tax rate limitations. In contrast, base changes come largely from economic factors outside the control of local officials. This point is recognized by Driessen and Sheffrin, whose model 2 is designed to capture the factors that constrain the property tax rate.

Second, changes in the tax rate result in behavioral responses that alter the associated tax base. Although this framework is not behavioral, it hints that the level of the property tax in a particular city might depend on the extent to which increases in the property tax rate are expected to lower the property tax base. If a city is a small share of a metropolitan area, for example, an increase in the property tax rate might encourage businesses to move to the suburbs. This is a key example of the need to account for variations in the local government system across cities—a subject that might be pursued in research that builds on this chapter.

Third, changes in the property tax share depend on changes in the rates and bases for other revenue sources. If tax rates do not change and every base grows at the same rate, the change in the property tax share equals zero. This result holds no matter how fast property prices increase. Moreover, rate changes for local sales or income taxes are usually severely constrained by states, so the main factor driving the property tax share might be the relative growth in the various tax bases—not the level or growth in a single tax base. The sales tax variable in the authors' model 2 regressions was usually significant in a negative direction: that is, growth in the sales tax base does appear to lower the local property tax share.

Fourth, the "other" revenue category varies widely across cities. The model 2 regressions included a measure of state aid and found, somewhat surprisingly, that higher state aid led to a greater reliance on the local property tax. One possible explanation is that despite tax limitations, the property tax is still easier to raise in many places than are other taxes, and higher state aid leads to a much higher demand for public services, as found by Eom et al. (2014) and Nguyen-Hoang and Yinger (2014). A few cities also have an income tax, which obviously has a large impact on the property tax share. Helen Ladd and I found that these cities tend to be in poor fiscal health (Ladd and Yinger 1991). Thus, a variable to measure the income tax share would be helpful in future work.

My second framework is a lagged adjustment model, which is Driessen and Sheffrin's model 1. The starting point for this framework is the assumption that voters and/or elected officials can define an optimal property tax share (or "desired" property tax share, to use the term in this chapter) based on conditions in their city. Each year, a jurisdiction closes a portion of the difference between the actual property tax share and this optimal share, as expressed in the following equation:

$$\sigma_{Pt}^{*} = \alpha + \beta X_t + \gamma C_t$$

where * = a desired value;

X = factors that encourage use of the property tax; and

C = factors that discourage use of the property tax.

The second step in this framework is the assumption that each year, a city closes a certain portion, λ, of the difference between its actual and desired

property tax share. With μ as an error term, this assumption can be written as follows:

$$\sigma_{Pt} - \sigma_{P(t-1)} = \lambda\left(\sigma^{*}_{Pt} - \sigma_{P(t-1)}\right) + \mu_{Pt}$$

After a little algebra, these two equations lead to the lagged adjustment equation:

$$\sigma_{Pt} = \lambda\alpha + \lambda\beta X_t + \lambda\gamma C_t + (1-\lambda)\sigma_{P(t-1)} + \mu_{Pt}$$

This equation was implemented in the regressions reported in table 5.9. To be specific, this table describes regressions of the property tax share (σ_{Pt}) on the lagged property tax share ($\sigma_{P(t-1)}$) and control variables to capture *X* and *C*. The authors found that the speed of adjustment (that is, the rate at which the gap between the desired and actual tax shares was closed) was quite slow—a little more than 2 percent per year.

These regressions controlled for region, the employment-to-population ratio (a proxy for the presence of business property), and the "actual-to-fiscalized-city-tax ratio." The employment-to-population ratio is a reasonable proxy for the presence of business property, but its use came at a high price because it was available for only half of the original observations. The tax ratio variable appears to indicate whether a city taxed commercial property higher than residential property. The dummy for the South was positive in several of the regressions. According to Driessen and Sheffrin, this result "suggests that cities in the South have increased their property tax shares relative to cities in the Midwest [the omitted category] in recent years." In fact, however, the coefficients of the explanatory variables indicate differences in the *desired* property tax share and do not say anything about how this desired tax share changed over time.

The regressions for model 2 (tables 5.10a, 5.10b, 5.11a, and 5.11b) add many more variables to explain property tax share. Property tax limitations, for example, make it difficult for a city to have a high property tax share. Moreover, intergovernmental transfers make it possible for a city to reduce its reliance on other taxes—and thereby increase the property tax share. Some of the other variables, such as land values, are more difficult to interpret. High land values could be accompanied, after all, by high sales or income tax bases.

Overall, the regressions in this chapter could be taken much further. First, Driessen and Sheffrin's strategy for selecting explanatory variables for model 1 is puzzling. Although both models were designed to explain the property tax share, only a subset of the variables in model 2 was included in model 1. If the desired local property tax share depends on the presence of a tax limitation, for example, the lagged adjustment model should include this variable.

Second, the justification for model 2 is not compelling. The authors claim that this model applies when governments find it difficult to change tax rates. With a lagged adjustment framework, however, a zero coefficient for the lagged property

tax share, which was the specification for their model 2, implies *instantaneous* adjustment to changes in factors that influence the desired share, not no adjustment at all. These comments reinforce the point from the previous paragraph: the most compelling formulation for future research would be a lagged adjustment model with an extensive set of variables that influence the desired property tax share.

Third, the authors missed an opportunity to study why the speed of adjustment varies from one city to another. Does a tax limitation, for example, lower the rate at which a city closes the gap between desired and actual spending? This question could easily be addressed with an interaction between a tax limitation and the lagged property tax share.

Finally, the lagged adjustment framework could provide a way to connect with the large literature on incentives created by property tax design. From the perspective of voters, for example, the main variable influencing the desired property tax share is probably the tax price, which in this context is the share of each additional dollar of property tax paid by homeowners. (Note: Strictly speaking, the tax price includes the marginal costs of public services, matching aid, and perhaps other things, as well as the residential share of an additional dollar of revenue. I prefer to call the last concept the tax share, but to avoid confusion, I refer to it as the tax price here.) Voters who know that a large share of any tax increase will be paid by commercial and industrial property owners are more likely to vote for a property tax rate increase. This type of response has been observed by scholars in many different situations. See, for example, the articles on property tax exemptions that change tax shares by Eom et al. (2014) and Rockoff (2010). The "actual-to-fiscalized-city-tax ratio" variable measures assessment practices but sheds no light on the residential and business tax bases.

Overall, this chapter is a valuable exploration of an important new data set. Further research on this topic would benefit from a consideration of the fiscal differences across cities that the data set pushes into the background and from the development of a conceptual framework (or two) to inform the empirical work and to aid in the interpretation of the results.

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6

Local Government Finances During and After the Great Recession

Adam H. Langley

By most measures, the Great Recession of 2007–2009 was the most severe economic downturn the United States has experienced since the 1930s. Nearly nine million Americans lost their jobs, median household income fell 8 percent when adjusted for inflation, and housing prices fell nearly 20 percent nationally.[1] These economic shocks had major impacts on local government finances. Most notably, the two main revenue sources for local governments declined simultaneously for the first time since 1980 (Pew Charitable Trusts 2012): steep declines in state tax revenues led to cuts in state aid for local governments, and falling housing prices triggered drops in property taxes. Meanwhile, many localities also faced growing demand for their services due to higher numbers of poor and unemployed residents.

Such fiscal pressures on local governments can have serious consequences. These governments provide many of the key public services that affect the everyday lives of residents, including K–12 education, police and fire protection, sewers and waste management, parks administration, public transit, public housing, and much more. They also build and maintain a large share of the nation's public infrastructure. Local governments that cannot provide quality public services at competitive tax rates have a difficult time attracting and retaining residents and businesses and, in the worst case, could face a downward spiral of population decline and disinvestment. Fiscal pressures also affect the labor market, since

1. Data from Federal Reserve Economic Data (FRED) series: "Total Nonfarm Employment, Seasonally Adjusted" (PAYEMS); "Real Median Household Income in the United States" (MEHOINUSA672N); and "All-Transactions House Price Index for the United States" (USSTHPI).

local governments are major employers, providing about one in ten jobs in the United States. In the aftermath of the Great Recession, hundreds of thousands of local government employees lost their jobs, which not only affected their own households but also held back the broader economic recovery.

This chapter uses a variety of data sources and summarizes existing research to describe how the Great Recession has affected local governments.

The Great Recession Compared with Previous Recessions

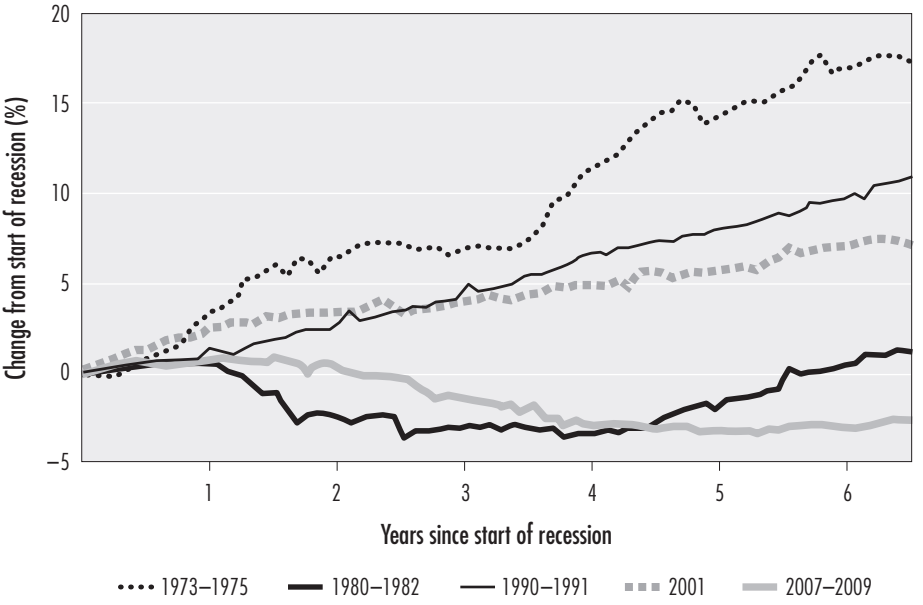
The Great Recession has had a much larger impact on local governments than almost all other recent recessions, with the only comparable decline occurring during the double-dip recession of 1980–1982. One way to measure this impact is to look at local government employment trends (figure 6.1). These trends have a significant effect on the overall employment picture because the local government sector is very labor-intensive; it accounted for 10.5 percent of total U.S. employment at the start of the Great Recession, compared with 2.0 and 3.7 percent for the federal and state governments, respectively.[2]

Historically, local government employment has held up fairly well during economic downturns and did not decline at all during the recessions of 1973–1975, 1990–1991, or 2001. In contrast, it fell 3.2 percent following the Great Recession, similar only to the 3.6 percent drop during the 1980–1982 recession. But while the level of contraction was similar in the two recessions, the timing was very different. Local government employment began to fall rapidly in late 1980; bottomed out in late 1983, almost four years after the start of the recession; but then quickly recovered and reached prerecession levels after five and a half years. In contrast, the American Recovery and Reinvestment Act (ARRA) of 2009 helped prop up employment during the first two years after the Great Recession. Local government employment did not hit bottom until early 2013, and six and a half years after the start of the recession, employment was still 2.6 percent below prerecession levels, meaning there were 382,000 fewer jobs in this sector.

The drop in local government employment has been a major drag on economic recovery. Harris and Shadunsky (2013) used a macroeconomic framework to measure the state and local government sector's contribution to GDP, which means they included spending on consumption and investment, but excluded government transfers and interest payments. They found that in the past four decades, state and local governments contributed to economic growth in every year except 1981 and the three years following the Great Recession. In addition, three years after the trough of the previous five recoveries, the state-local sector's

2. U.S. Bureau of Labor Statistics, Current Employment Statistics, Seasonally Adjusted, December 2007.

Figure 6.1
Change in Local Government Employment in the Past Five Recessions



Note: Recession dates are from the National Bureau of Economic Research.
Source: U.S. Bureau of Labor Statistics, Current Employment Statistics, Seasonally Adjusted.

contribution to real GDP growth had averaged 6 percent and was never negative. At that stage following the Great Recession, however, this sector's consumption and investment had actually fallen 4 percent.

Local Government Revenues During the Great Recession

This section looks at five broad revenue categories to determine how local government revenues performed during the Great Recession. Table 6.1 shows the revenue composition of the local government sector in FY07 before the recession began.

The two most important revenue categories were intergovernmental revenues, comprising state and federal aid (37.5 percent of general revenues), and property taxes (28.0 percent), which together accounted for about two-thirds of local government general revenues. The other three categories were non-property taxes (11.1 percent), including general sales, income, and other taxes; user charges (15.6 percent); and miscellaneous revenues (7.8 percent). Unless otherwise noted,

Table 6.1
Local Government General Revenues, FY07

Percentage of Revenues	Revenue Category
37.5	**Intergovernmental revenues**
33.2	State aid
4.3	Federal aid
28.0	**Property taxes**
11.1	**Non-property taxes**
4.6	General sales taxes
2.4	Income taxes
3.2	Excise taxes, licenses, and other
15.6	**User charges**
7.8	**Miscellaneous revenues**
3.3	Interest earnings
4.4	Other

Source: Tax Policy Center (2014).

all revenue and expenditure figures in this chapter have been adjusted for inflation and population growth to allow for more meaningful comparisons over time.

STATE AND FEDERAL AID

In FY09 and FY10, states faced the largest declines in tax revenues since at least the late 1970s, and while tax revenues steadily recovered after that, in FY13 they were still nearly 5 percent below their FY07 peak (U.S. Census Bureau 2014). Cuts in state spending were postponed for several years following the Great Recession, however, because ARRA provided states with about $150 billion in federal stimulus aid in the years FY09–FY11, which meant the largest cuts occurred in FY12 once most of the federal aid was gone (McNichol 2012).

Propped up by ARRA, combined state and federal aid to local governments was basically flat through FY10, but then fell in FY11, when it was 2.1 percent lower than in FY07 (table 6.2). While comprehensive data are not available for FY12, the data that do exist suggest that state and federal aid fell considerably in that year, too.

With most stimulus funds gone, state spending from federal funds fell $51.5 billion from FY11 to FY12, a drop equal to 3.2 percent of total state spending in FY11. Thus, despite modest growth in spending supported by state funds, total state spending fell by $26.9 billion in FY12, the first year with a nominal

Table 6.2
Real Per Capita Local Government Revenues Compared with FY07, FY08–FY11 (% change)

	FY08	FY09	FY10	FY11
General revenues	–0.6	0.4	–1.3	–3.3
Intergovernmental revenues	–0.9	0.5	–0.2	–2.1
State aid	–0.5	0.2	–1.5	–4.0
Federal aid	–3.8	2.4	10.1	12.0
Property taxes	0.7	5.5	4.9	1.7
Non-property taxes	–2.6	–7.4	–12.8	–11.5
General sales taxes	–0.9	–3.1	–7.1	–6.3
Income taxes	1.7	–6.0	–12.9	–9.5
Excise taxes, licenses, and other	–7.0	–13.1	–19.1	–18.6
User charges	0.7	4.6	5.5	5.0
Miscellaneous revenues	–3.7	–15.7	–26.1	–31.7
Interest earnings	–0.6	–25.5	–46.0	–53.4
Other	–6.1	–8.4	–11.2	–15.4

Source: Tax Policy Center (2014).

decline in state spending since at least 1987 (NASBO 2013).[3] Real per capita state spending grew 2.1 percent in FY13, but it was still lower than it had been in FY11, given the 4.3 percent drop in FY12.

The end of stimulus aid also affected federal aid that went directly to localities. On a real per capita basis, total federal grants to state and local governments fell 12.4 percent in FY12 and another 2.1 percent in FY13 (Office of Management and Budget).[4] The end of federal stimulus means that real per capita state and federal aid to local governments likely bottomed out in FY12, despite the fact that state and federal revenues hit their low points in FY10 and FY09, respectively.

3. Total state spending data from NASBO (2013) were adjusted for inflation using the annual average of the seasonally adjusted Consumer Price Index for All Urban Consumers (CPI-U), and for population growth using the Total Population of the U.S. (*http://research.stlouisfed.org/fred2/series/POP*) for June of each year.

4. Total federal grants to state and local governments reported by the Office of Management and Budget (multiple years) were adjusted in the same manner as total state spending. Note that the U.S. Census Bureau treats most federal aid to local governments that flows through states as state aid.

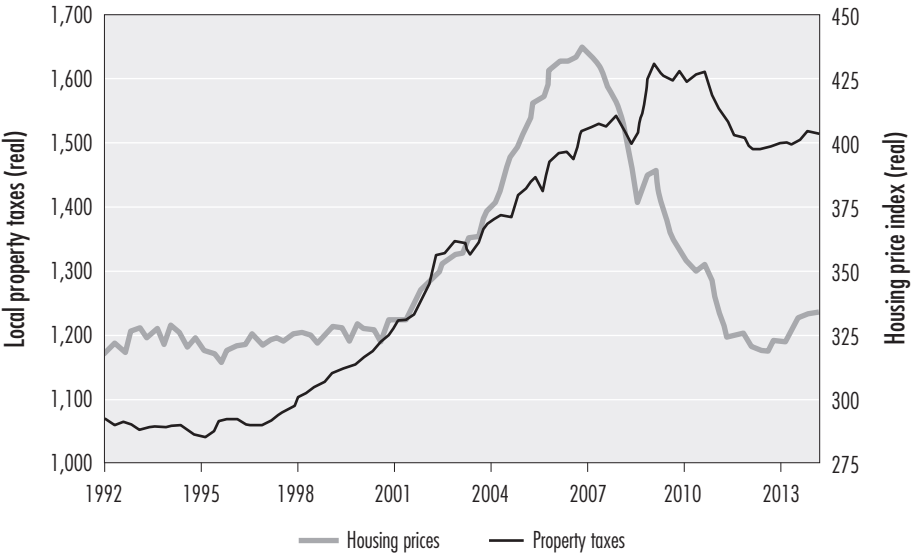
PROPERTY TAXES

Property tax revenue held up fairly well during the Great Recession itself despite the unprecedented collapse in home values, but local governments then experienced significant declines during 2010–2012 for the first time since the tax revolts of the late 1970s and early 1980s. Figure 6.2 highlights two key facts about property taxes during the housing bust.

First, the fall in property taxes lagged the drop in housing prices by nearly four years: while inflation-adjusted housing prices peaked in the fourth quarter of 2006, real per capita local property taxes hovered near all-time highs through the third quarter of 2010. Second, the drop in property taxes from peak to trough was modest (8.5 percent) compared with the plunge in housing prices (27.1 percent).

The lag between changes in property values and responses in property tax revenues occurs primarily because property tax bills are based on assessments from previous years. Multiyear reassessment cycles, assessment limits, and phase-ins of higher assessments can also play a role in this lag. Previous research suggests that three years is an average lag time, although the lag varies significantly across jurisdictions due to differences in administrative practices (Chernick, Langley, and

Figure 6.2
Local Property Taxes and Housing Prices, 1992–2013



Note: Local property taxes prior to the fourth quarter of 2008 were adjusted upward by 7.7 percent to account for changes in the U.S. Census Bureau's quarterly property tax survey, including sample selection, data editing, and imputation methods. This adjustment follows the approach taken in Dadayan (2012) and Pew Charitable Trusts (2012).
Sources: U.S. All Transactions Index (Federal Housing Finance Agency) adjusted with CPI-U; U.S. Census Bureau (2014).

Reschovsky 2012; Lutz 2008). That property taxes peaked nearly four years after the peak in housing prices is consistent with that research. However, there was no lag between when housing prices and property taxes hit their trough; both bottomed out in early 2012. It is possible that the features of the property tax system that caused the lag between changes in housing prices and property taxes in the past do not have the same effect during periods of rapidly declining home values. Housing prices began growing in 2013, but with the typical lag observed during periods of increasing values, it is likely that this growth will not be reflected in property tax collections until 2015 or 2016.

The limited responsiveness of property taxes to changes in property values is arguably one of the strengths of the property tax, since it provides local governments with a stable revenue source. This stability is a result of two factors: property values have historically been a fairly stable tax base, and local governments have a significant degree of rate-setting flexibility. It is much easier to adjust property tax rates than it is to change sales or income tax rates. Ross, Yan, and Johnson (2013) used 2005–2011 Comprehensive Annual Financial Report (CAFR) data for the municipal governments of the 35 largest U.S. cities and concluded that property taxes largely behaved as a residual revenue source, with cities able to adjust their property tax collections to maintain stability in the overall level of revenues.

NON-PROPERTY TAXES

For the local government sector as a whole, taxes other than property taxes are not a very large revenue source. Together they accounted for 11.1 percent of prerecession general revenues, with general sales taxes contributing 4.6 percent, income taxes 2.4 percent, and other taxes 3.2 percent (see table 6.1). However, looking at the sector as a whole obscures wide variations in the importance of these taxes. Many local governments do not use them at all, but those that do often derive a significant share of their total revenues from them. Large city governments, in particular, rely on these taxes more heavily. For example, 73 of 112 large U.S. cities imposed general sales taxes in FY07, and on average they raised 13.9 percent of their general revenues from them. In contrast, 22 of the 112 cities used income taxes, which accounted for 22.3 percent of their revenues on average.[5]

Table 6.2 shows changes in real per capita revenues for these three nonproperty taxes relative to FY07 levels for the local government sector as a whole. All three taxes declined significantly in FY09 and then bottomed out in FY10:

5. These data come from the Lincoln Institute of Land Policy's Fiscally Standardized Cities (FiSC) database (*www.lincolninst.edu/subcenters/fiscally-standardized-cities/*). They are for city governments, not FiSCs.

general sales taxes were 7 percent lower than in FY07, income taxes were 13 percent lower, and other non-property taxes were 19 percent lower.[6]

Comprehensive data on local government taxes other than property taxes were available only through 2011 at the time of this writing, but recent growth in state income, sales, and other non-property taxes suggests that they likely rebounded for local governments in 2012 and 2013. On a real per capita basis, state tax revenues grew for all three sources from their 2010 troughs to 2013, with income taxes growing the fastest (19.7 percent), followed by other non-property taxes (7.4 percent) and sales taxes (2.4 percent) (U.S. Census Bureau 2014).[7] It appears that strong income tax growth in FY13 was driven in large part by temporary factors, as high-income taxpayers accelerated income and capital gains into the 2012 tax year to avoid scheduled increases in top rates for federal taxes on ordinary income and capital gains (Boyd and Dadayan 2013). Growth slowed in the first half of FY14 (Dadayan and Boyd 2014b).

USER CHARGES

User charges were the most resilient revenue source for local governments during the Great Recession. Real per capita charges grew 4.6 percent in FY09 and have been steady since then, so that in FY11 they were 5.0 percent above FY07 levels (see table 6.2). The growth in revenues from user charges during the worst of the Great Recession in FY09 does not appear to be the result of unusual policy actions by local governments. In surveys, the number of city governments reporting that they increased fee levels during the 2009–2013 period (42 percent on average) or the number of fees (24 percent) was actually slightly lower than the proportion doing so during the 2001–2008 period (46 percent and 26 percent, respectively) (National League of Cities 2001–2013). The resilience of charges is unsurprising given the steady growth in charges in recent decades. Real per capita charges grew 2.7 percent per year on average from 1977 to 2011, without any particularly large year-to-year increases or decreases, and with only four years of declines (Tax Policy Center 2014).

MISCELLANEOUS REVENUES AND RESERVES

Despite being a small part of local government budgets, miscellaneous revenues accounted for more than three-quarters of the overall drop in real per capita local government revenues between FY07 and FY11 (see figure 6.3 later in this chapter). Interest earnings accounted for most of this decline; they fell 53 percent over this time period (see table 6.2). Research by the Pew Charitable Trusts (2013a)

6. In FY07, selective sales taxes accounted for 46 percent of other non-property taxes, license taxes 31 percent, and taxes not elsewhere classified 23 percent. From FY07 to FY10, these taxes declined 3 percent, 23 percent, and 43 percent, respectively (Tax Policy Center 2014).

7. Income taxes are individual income and corporate income taxes combined, sales taxes include gross receipts, and other taxes are all other taxes except property taxes.

found that interest earnings also played a disproportionate role in revenue declines for the country's largest cities. That research used data from CAFRs for the municipal governments of 30 large U.S. cities and found that nontax revenue—a category consisting primarily of investment income—was the primary cause of revenue losses for nine of those cities, far more than any other category of own-source revenues.

Part of the reason for the decline in interest earnings was that localities drew down their reserves to avoid making larger spending cuts during the recession. City ending balances fell 6.2 percentage points in FY09 and another 1.7 points in FY10, which is when they bottomed out at 16.5 percent of general fund expenditures (Pagano and McFarland 2013). Similarly, the Pew Charitable Trusts (2013a) found that all 30 large U.S. cities it studied drew from reserves during the Great Recession, and Ross, Yan, and Johnson (2013) concluded that the 35 largest U.S. cities reduced net assets in a form of deficit spending.

However, many smaller local governments with large reserves did not draw from them during the recession. For example, an analysis of more than 6,000 local government financial reports found that average unreserved general fund balances fell from 37 percent in FY07 to 29 percent in FY09, and then rebounded to 31 percent in FY11. However, the averages do not reflect the experiences of most localities. Although about one in four drew down most or all of their reserve funds, the great majority cut spending instead (Marlowe 2013).

A big part of the explanation for declining interest earnings lies in the very low interest rates that have prevailed since the Great Recession. Local governments are generally required to hold their idle cash in very safe and liquid investments, such as U.S. treasury bills, and they often rely on money market mutual funds or local government investment pools that hold similar investments. The low interest rate environment has made it practically impossible to find significant yields on these types of investments. For example, the secondary market rate for three-month treasury bills fell steadily from 5.03 percent in February 2007 to 0.19 percent in November 2008. The rate stayed below 0.2 percent through early 2011, and has since stayed below 0.1 percent.[8] In early 2014, gross investment returns were around 0.2 percent on prime local government investment pools (Wright 2014).

The impact of declining interest earnings on operating budgets varies depending on how cities use their reserves. The immediate impact would be limited in cities that use compounding interest earnings to build up their reserves. However, many local governments are happy with their reserve levels and worry that growing them further could create political pressure to spend them down.

8. Board of Governors of the Federal Reserve System, H.15 Selected Interest Rates. Data downloaded from Federal Reserve Economic Data, Series TB3MS (*https://research.stlouisfed.org/fred2/series/TB3MS*).

Those localities might regularly use interest earnings to fund current operations (Marlowe 2014).

TYING IT ALL TOGETHER

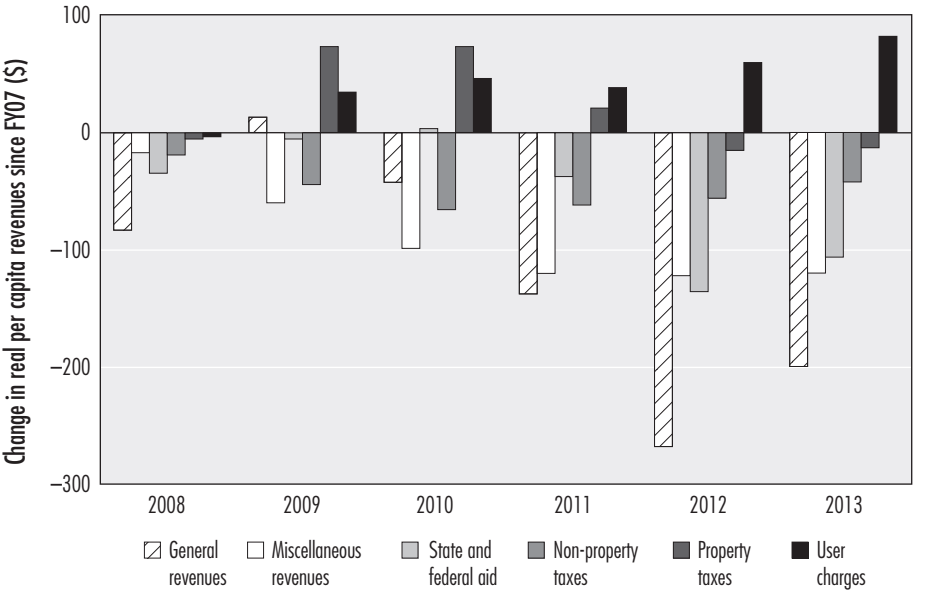
Real per capita local government general revenues fell 1.7 percent in FY10 and another 2.0 percent in FY11, the first declines since the tax revolts of the late 1970s and early 1980s (Tax Policy Center 2014). The latest comprehensive data on local revenues available at this writing is FY11, but localities have continued to experience significant fiscal pressures. Figure 6.3 presents changes in real per capita revenues relative to their prerecession levels in FY07—actual revenues through FY11 and estimated revenues for FY12–FY13. The estimated revenues are based on the following data sources and assumptions.[9]

- *Property taxes*: up-to-date data from the U.S. Census Bureau (2014)
- *State aid*: matches changes in total state spending reported by NASBO (2013)
- *Federal aid*: matches changes in total federal grants to state and local governments reported by the Office of Management and Budget (multiple years)
- *Non-property taxes*: changes for local governments match changes in state taxes reported by the U.S. Census Bureau (2014), with estimates done separately for sales and gross receipts taxes, income taxes, and other taxes to account for differences in reliance on these taxes at the state versus the local level
- *User charges*: assumed to have grown at their historical growth rate of 2.7 percent, reflecting the typical stability of this revenue source
- *Miscellaneous revenues*: assumed to have stayed flat in real per capita terms, reflecting the continuation of very low interest rates through 2013

Overall, general revenues are projected to have bottomed out in FY12, when they are estimated to be 5.5 percent lower than in FY07. General revenues are expected to grow in FY13 but remain at levels about 4 percent lower than in FY07. The estimated 2012 trough is consistent with several data sources. For example, surveys of city finance officers found that inflation-adjusted general fund revenues fell 0.9 percent in FY12 and were basically flat in FY13, with 0.1 percent growth (Pagano and McFarland 2013). Local government employment did not hit its nadir until March 2013, toward the end of the fiscal year for most governments (see figure 6.1).

9. For the six revenue categories, annual percentage changes for 2011–2013 were first calculated based on the sources described in the text and then adjusted for inflation and population growth. Then revenue levels for 2012 and 2013 were calculated based on the estimated percentage change in real per capita revenues for 2011–2013 and actual revenue levels in 2011.

Figure 6.3
Actual (2008–2011) and Estimated (2012–2013) Changes in Real Per Capita Local Government Revenues Compared with FY07



Sources: Data for 2007–2011 are from U.S. Census Bureau (2013). Estimated data for 2012–2013 are based on a variety of sources and some assumptions (see text for details).

This means that local government revenues hit bottom about three years after the Great Recession officially ended in June 2009. This lag was driven by changes in intergovernmental revenues and property taxes. The end of most federal stimulus meant that state and federal aid to local governments likely declined steeply between FY11 and FY12, with a projected decline of 4.3 percent in state aid. Similarly, the lag between changes in housing prices and subsequent changes in property taxes meant that property taxes did not hit their trough until FY12, when they were 2.7 percent below FY07 levels. Before their declines in FY11 and FY12, strong growth in property taxes and stable intergovernmental revenues meant that general revenues held fairly steady through FY10.

For the other categories, the biggest driver of revenue declines was miscellaneous revenues (driven by a 53 percent drop in interest earnings), which accounted for a full three-quarters of the drop in general revenues as of FY11. The immediate impact of this drop varied, however, depending on whether or not localities regularly used interest earnings to fund operating budgets. Nonproperty taxes also declined considerably, dropping 12 percent from their 2007

peak (although the impact of declines in these taxes would vary across cities based on each city's reliance on them). Recent data on state taxes suggest that non-property tax revenues have begun to recover for local governments, but they are likely still significantly below 2007 levels. Finally, user charges were the most resilient revenue source during the Great Recession, although increases in them were not nearly enough to offset declines in other revenues.

Local Government Spending During the Great Recession

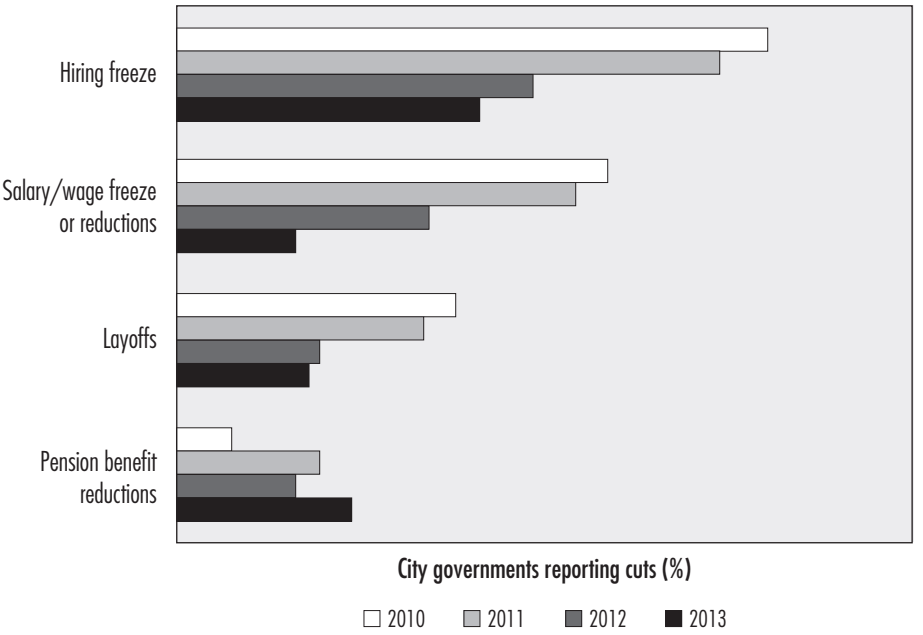
Expenditures were notably more volatile than revenues during the Great Recession. In real per capita terms, general expenditures actually rose 4.7 percent from FY07 to FY09, whereas general revenues were basically flat (0.4 percent increase). After a peak in FY09, however, spending dropped much more sharply than revenues, falling 6.3 percent by FY11 versus 3.7 percent for revenues (Tax Policy Center 2014). Such spending fluctuations can have detrimental consequences, such as governments expanding and then contracting programs, hiring and then laying off staff.

In FY09, local government expenditures—which are based on expected revenues—significantly exceeded actual revenues. That year, state revenue forecasts dramatically overestimated actual revenues (Pew Charitable Trusts and Rockefeller Institute of Government 2011), so states were forced to make large mid-year budget cuts that totaled 5.0 percent of their general fund revenues (NASBO 2009). Local governments were directly affected by these cuts, and many may have overestimated their own-source revenues as well. With these unexpected revenue declines, many localities used reserves to avoid mid-year budget cuts in FY09, when cities' ending balances dropped 25 percent according to surveys of city finance officers (Pagano and McFarland 2013). In FY10 and FY11, localities responded to lower revenue levels by making significant spending cuts, which were much larger than they would have been without the large spending increases in FY09.

Labor costs account for a large share of local government budgets, so cutting personnel expenses was one of the main ways localities cut spending during the Great Recession. As discussed earlier, local government employment dropped sharply during this period, with the number of employees falling by 595,000 from the July 2008 peak to the March 2013 trough. The cuts were borne disproportionately by teachers and other school employees, with education employment falling 4.4 percent, versus a 3.7 percent drop for non-education employment.[10] (Compared with the 1980–1982 recession, the Great Recession saw much larger declines in education employment, but smaller declines in non-education employment [Dadayan and Boyd 2014a].)

10. U.S. Bureau of Labor Statistics, Current Employment Statistics, Seasonally Adjusted.

Figure 6.4
Percentage of City Governments Reporting Personnel-Related Spending Cuts, 2010–2013



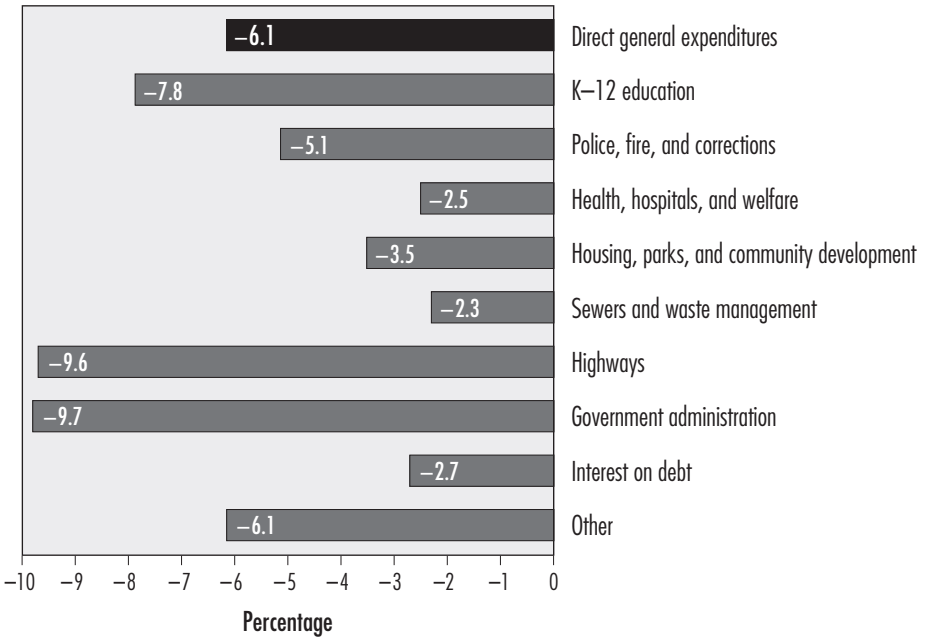
Source: Selected data from Pagano and McFarland (2013).

Figure 6.4 shows specific personnel-related cuts made by city governments during the period from 2010 to 2013. The most common action taken was the institution of a hiring freeze (74 percent of cities did so in 2010), followed by a salary/wage freeze or reductions (54 percent) and layoffs (35 percent). The percentage of cities using these three personnel cuts decreased somewhat in 2011 and was significantly lower in 2012 and 2013. The one notable exception to the declining use of personnel cuts was the use of pension benefit reductions, which grew from 7 percent in 2010 to 22 percent in 2013.

Figure 6.5 compares local government expenditures in FY09 and FY11. Overall, real per capita local government direct general expenditures declined 6.1 percent.[11] While all nine categories listed in this figure experienced declines,

11. The 6.1 percent decline in *direct* general expenditures ($4,866 to $4,570) is less than the previously cited 6.3 percent in general expenditures ($4,928 to $4,617) because of the exclusion of intergovernmental expenditures ($52 to $44) and the use of different data sources to adjust for inflation and population growth. General expenditures were used for the earlier

Figure 6.5
Changes in Real Per Capita Local Government Direct General Expenditures from FY09 to FY11 (%)



Source: U.S. Census Bureau (2013).

the cuts were not spread evenly. In particular, spending on K–12 education decreased 7.8 percent, bearing slightly more than half the burden of all the cuts in general expenditures. Other categories that experienced larger-than-average cuts were highways (–9.6 percent) and government administration (–9.7 percent). Spending on police, fire, and corrections declined a bit less than average (–5.1 percent). Health, hospitals, and welfare; housing, parks, and community development; sewers and waste management; and interest on debt declined significantly less than average. Not shown in the graph is that total spending on capital outlays declined much more than current operations, –16.0 percent versus –4.5 percent (Tax Policy Center 2014).

Measuring the impact of spending cuts on the quality of services received by residents is a challenge. While modest spending reductions may not reduce service

calculation because they are analogous to general revenues; intergovernmental expenditures were excluded from the later calculation because the U.S. Census Bureau excludes them from the functional categories in its summary tables.

quality if they are offset by increased efficiency, large cuts will almost certainly erode quality. For example, the Sacramento police budget was cut more than 30 percent between 2008 and 2011, and the police stopped responding to burglaries, misdemeanors, and minor traffic accidents. In 2011, the number of shootings increased 48 percent (Goode 2012). Similarly, since the Great Recession some schools have cut summer school programs or the number of school days, and some have switched to a four-day school week. California allowed school districts to cut up to seven school days, while Arizona allowed reductions of up to five days (Dillon 2011). In addition, demand for public services grows during a recession, exacerbating the challenge of maintaining service quality. For example, the U.S. poverty rate grew 18 percent from 2007 to 2011, driving up the need for a wide range of social services.[12] Finally, measures to boost efficiency, such as investments in new technology, may reduce costs in the long run but often require large up-front investments that are not feasible when budgets are tight (Pew Charitable Trusts 2012).

Variations in Revenue Changes for Large U.S. Cities

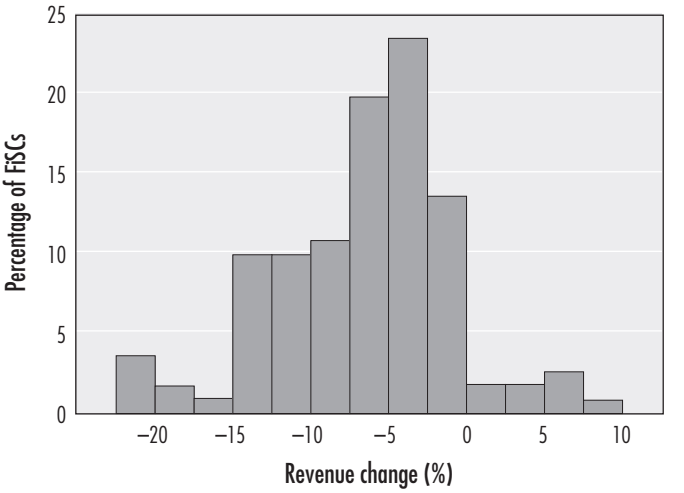
Data on revenue changes for the local government sector as a whole conceals significant variations across cities. In fact, while most large cities have faced at least some revenue declines, the magnitude of these declines varies widely. To compare local government finances at the city level, this section uses data from the Lincoln Institute of Land Policy's Fiscally Standardized Cities (FiSC) database, a publicly available data set for 112 of the most populous U.S. cities.[13] The FiSC methodology accounts for differences in local government structure across cities by adding together city government revenues plus an appropriate share of revenues from overlying county governments, independent school districts, and special districts. Thus, data on fiscally standardized cities (FiSCs) provide a full picture of revenues raised from city residents and businesses, and the spending on their behalf, whether done by the city government or a separate overlying government. These estimates are valuable because economic outcomes and residents' quality of life in each city are affected by the combined tax burden and total package of services from all overlying governments, not the specific government imposing each tax or providing each service. However, it should be noted that FiSCs are not decision-making bodies and are poorly suited for studying policy changes made by individual governments. Langley (2013) provides a full description of the FiSC methodology.

Figure 6.6 presents real per capita general revenue changes for the 112 FiSCs from their peak to FY11. The most common changes were revenue declines

12. The poverty rate (for individuals) is from the one-year American Community Survey, American FactFinder, *http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml*.

13. The data set is available at *www.lincolninst.edu/subcenters/fiscally-standardized-cities/*.

Figure 6.6
Changes in Real Per Capita General Revenues for 112 Fiscally Standardized Cities from Their Peak to FY11



Note: For eight FiSCs whose peak revenues occurred in FY11, revenue change is reported for FY07–FY11.
Source: Fiscally Standardized Cities database, Lincoln Institute of Land Policy, *www.lincolninst.edu/subcenters/fiscally-standardized-cities/*.

between 2.5 and 7.5 percent, with 43 percent of FiSCs facing decreases in this range. However, more than a quarter of the FiSCs had revenue declines exceeding 10 percent, while only eight avoided revenue declines entirely through FY11.

One important policy question is whether the size of revenue declines was affected by the cities' fiscal structure, or whether it was simply the result of local differences in the economic impact of the recession. To investigate this question, a series of univariate regressions are used to predict the FY08–FY11 revenue changes for each FiSC as a function of economic changes in its region. Given regional economic changes, FY11 revenues for each FiSC are predicted in two ways: (1) using each FiSC's *actual* revenue structure in FY08; and (2) using the *average* revenue structure for all FiSCs in FY08. Revenue changes predicted using the average revenue structure are attributed to economic factors, while the difference between the two predictions is attributed to each FiSC's revenue structure. Finally, an analysis was conducted to estimate how much of the variation in the FiSCs' actual revenue changes between FY08 and FY11 was due to economic factors versus differences in revenue structure.

Univariate regressions are used to estimate the effect of economic changes on the four largest revenue categories for FiSCs: property taxes, non-property taxes, user charges, and state aid. Changes in economic variables are lagged by one or two years to account for differences between fiscal years and calendar years and

for the lagged relationship between changes in housing prices and changes in property taxes. All of the variables are measured in real per capita dollars, with the house price index simply adjusted for inflation. The four regressions are as follows:

$$\Delta\ln(\text{Property Taxes}_i)_{2008\text{–}2011} = \alpha_0 + \alpha_1\Delta\ln(\text{House Price Index}_i)_{2006\text{–}2009} + \varepsilon_i$$

where House Price Index is the annual average of the metropolitan area all-transaction housing price index produced by the Federal Housing Finance Agency[14]

$$\Delta\ln(\text{Non-property Taxes}_i)_{2008\text{–}2011} = \beta_0 + \beta_1\Delta\ln(\text{Personal Income}_i)_{2007\text{–}2010} + \varepsilon_i$$

$$\Delta\ln(\text{User Charges}_i)_{2008\text{–}2011} = \gamma_0 + \gamma_1\Delta\ln(\text{Personal Income}_i)_{2007\text{–}2010} + \varepsilon_i$$

where Personal Income is for the county where each FiSC is located, using Local Area Personal Income data from the Bureau of Economic Analysis[15]

$$\Delta\ln(\text{State Aid}_i)_{2008\text{–}2011} = \delta_0 + \delta_1\Delta\ln(\text{State Government Revenues}_i)_{2008\text{–}2011} + \varepsilon_i$$

where State Government Revenues are the general revenues for the state government where each FiSC is located, using data from the Tax Policy Center (2014)

Results for the four regressions are shown in table 6.3. The average change for all FiSCs is used to predict changes in three revenue categories that account for a small share of the FiSCs' revenues and are hard to predict as a function of available data. The average change in logged values for FY08–FY11 was 0.142 for federal aid, –0.783 for interest earnings, and –0.056 for other miscellaneous general revenues.

Table 6.4 illustrates how revenue changes attributed to economic factors versus revenue structure were calculated, using the Boston FiSC as an example.

First, Boston's FY08 revenues ($6,385) were distributed to the seven revenue categories as if the city had the average revenue structure for all FiSCs. For example, if Boston's revenue structure matched the average for all FiSCs, the Boston FiSC would have collected less in per capita property taxes ($1,554 vs. $2,440) and more in non-property taxes ($853 vs. $159).

14. *www.fhfa.gov/DataTools/Downloads/Documents/HPI/HPI_AT_metro.csv.*

15. *www.bea.gov/itable/iTable.cfm?ReqID=70&step=1#reqid=70&step=1&isuri=1.*

Table 6.3
Predicting Revenue Changes for Fiscally Standardized Cities as a Function of Local Economic Changes

	(1) Δln(Property Taxes), 2008–2011	(2) Δln(Non-property Taxes), 2008–2011	(3) Δln(User Charges), 2008–2011	(4) Δln(State Aid), 2008–2011
Δln(House Price Index), 2006–2009	0.326***			
	(0.047)			
Δln(Personal Income), 2007–2010		0.819***	0.423**	
		(0.216)	(0.172)	
Δln(State Government Revenue), 2008–2011				0.870***
				(0.230)
Constant	0.0308***	–0.0626***	0.0441***	–0.0551***
	(0.011)	(0.013)	(0.013)	(0.013)
N	108	106	105	106
R^2	0.285	0.117	0.034	0.099
Adjusted R^2	0.279	0.109	0.025	0.090
F	48.43	14.33	6.032	14.36

Notes: Robust standard errors appear in parentheses. All variables are measured in real per capita dollars except for house prices, which are adjusted for inflation. All regressions exclude Washington, DC. FiSCs are dropped from the regressions if they have changes in either the explanatory or dependent variable that are more than three standard deviations outside the mean change for all FiSCs.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Second, regional economic changes were used to predict FY11 revenues for the seven categories using (1) actual FY08 revenues; and (2) FY08 revenues as if Boston had the average revenue structure. For example, logged inflation-adjusted housing prices declined 0.198 log points in the Boston metro area between 2006 and 2009. Given the coefficient estimates from equation 1 (see table 6.3), log property taxes are predicted to decline 0.034 points. That would be an $81 decline using the FiSC's actual revenue structure ($2,440 to $2,359), compared with a $52 decline using the average revenue structure ($1,554 to $1,502). In other words, the percentage change (technically, the log change) for each revenue category is determined by local economic changes, but identical log changes translate into different dollar changes depending on revenue levels in the base year. Therefore, variations in revenue composition will affect predicted revenue changes.

Third, FY11 general revenues for the two scenarios are calculated by summing the seven revenue categories.

Finally, actual FY08–FY11 revenue changes are attributed to economic factors and revenue structure. The change in predicted revenues that would have

Table 6.4
Identifying the Causes of Revenue Changes for the Boston FiSC, FY08–FY11

	General Revenues	Federal Aid	State Aid	Property Taxes	Non-property Taxes	User Charges	Interest Earnings	Other Miscellaneous Revenues
FY08 revenue structure (%)								
Average for FiSCs		5.8	32.0	24.3	13.4	16.4	3.7	4.3
Boston		10.7	34.5	38.2	2.5	7.2	1.7	5.1
FY08 revenues ($)								
With average revenue structure (I)	6,385	373	2,046	1,554	853	1,047	238	274
Actual (II)	**6,385 (A)**	685	2,205	2,440	159	459	112	326
FY11 revenues ($)								
Predicted with average revenue structure (III)	**6,100 (B)**	430	1,967	1,502	764	1,068	109	259
Predicted with actual revenue structure (IV)	**6,239 (C)**	789	2,121	2,359	142	468	51	309
Actual	**6,072 (D)**							
FY08–FY11 predicted revenue change ($)								
Average revenue structure: III – I	–285	57	–78	–51	–89	21	–129	–15
Actual revenue structure: IV – II	–146	104	–84	–81	–17	9	–61	–18
Difference: attributed to revenue structure	**138 (E)**	48	–6	–29	73	–12	68	–3
FY08–FY11 revenue change (%)					**Economic changes in Boston used for predictions**			
Actual: (D – A) / A	–4.9		–0.198		ΔIn(House Price Index), 2006–2009			
Changes attributed to:			–0.058		ΔIn(Personal Income), 2007–2010			
Economic factors: (B – A) / A	–4.5		0.019		ΔIn(State Government Revenue), 2008–2011			
Revenue structure: (C – B) / A, or E / A	2.2							
Other factors (unexplained): (D – C) / A	–2.6							

occurred if Boston had the average revenue structure is attributed to *economic factors*; in this scenario, Boston's revenues would have declined 4.5 percent ($6,385 to $6,100). Alternatively, revenues are predicted to decline only 2.3 percent when Boston's actual revenue structure is used, and the difference of 2.2 percentage points between the two scenarios is attributed to *revenue structure*. Compared to the average FiSC, Boston relies much less on non-property taxes and interest earnings (two revenue categories predicted to fall substantially) and more on federal aid (a category predicted to grow). These characteristics of Boston's revenue structure more than offset the FiSC's greater reliance on property taxes, which are predicted to decline.

Revenue changes are attributed to economic factors and revenue structure for the other FiSCs in the same way.

To determine the importance of these two factors, I calculated the squared semi-partial correlations of the FiSCs' actual FY08–FY11 percentage change in general revenues with changes attributed to economic factors and revenue structure. Calculating the squared semi-partial correlations is analogous to estimating the R^2 value between actual revenue changes and each factor, controlling for the effect of the other factor. This analysis suggests that economic factors were about six times more important than differences in revenue structure in explaining variations in revenue changes for the FiSCs. Economic factors explain 40.1 percent of the variation, and revenue structure explains 6.7 percent.[16]

It is not that surprising that economic factors played a greater role than revenue structure in explaining variations in FY08–FY11 revenue changes across the FiSCs. On one hand, the regression coefficients shown in table 6.3 suggest that FiSCs more reliant on property taxes and user charges would have done better than those more reliant on non-property taxes and state aid. Non-property taxes—including income, sales, and other taxes—are much more responsive to economic changes than property taxes or user charges. The estimated elasticities show that a 1 percent decline in personal income would lead to an almost equivalent drop in non-property taxes of 0.82 percent. In contrast, a 1 percent drop in personal income would lead to only a 0.42 percent decline in user charges, and a 1 percent drop in housing prices would lead to a 0.33 percent decline in property taxes. In addition, the constants are positive for property taxes and charges, but negative for non-property taxes and state aid.

Historically, property taxes have been a more stable revenue source for local governments than other types of taxes (Kenyon 2007), which is one of the main reasons to expect revenue structure to affect the size of revenue declines during a

16. Economic factors and revenue structure were both statistically significant at the 0.01 level. The correlations excluded two FiSCs with very large unexplained revenue changes. Anchorage, Alaska, had no actual decline in state aid despite a 29 percent drop in revenues for the state government. Durham, North Carolina, had a drop in real per capita federal aid of more than $900.

recession. However, the unprecedented decline in housing prices during the Great Recession meant that revenue structure was less important than in previous recessions. The elasticities in table 6.3 show that equivalent declines in housing prices and personal income would lead to a drop in non-property taxes that was two and a half times larger than the drop in property taxes. But the declines in these two economic variables were far from equivalent during the Great Recession. For the average FiSC, the 2006–2009 decline in inflation-adjusted housing prices (15.2 percent) was about three times larger than the 2007–2010 decline in real per capita personal income (5.1 percent). Thus, the much larger decline in housing prices offset the fact that property taxes are normally less responsive to changes in their tax base than other types of taxes. In contrast, in the previous four recessions, housing prices remained relatively stable. Therefore, the limited responsiveness of property taxes to housing price changes was bolstered by steady housing prices, which together made property taxes a more stable revenue source.

The impact of the Great Recession on local government finances varied greatly around the country. Real per capita general revenues declined in all but eight FiSCs; on average, revenues in FY11 were 7.2 percent lower than their previous peak for these FiSCs. More than a quarter of the FiSCs dealt with revenue declines exceeding 10 percent, but a fifth had declines of less than 2.5 percent or never declined at all. The analysis here finds that these variations were primarily due to large differences in the impact of the recession on local housing prices and incomes. These two economic factors were about six times more important than differences in revenue structure in explaining variations in revenue declines across FiSCs during the Great Recession. Revenue structure likely mattered less than in other recent recessions because the unprecedented decline in housing prices meant that differences across cities in their reliance on property taxes had a smaller impact on revenue stability than in the past. However, the limited responsiveness of property taxes to changes in housing prices also meant that the range of revenue declines across cities was smaller than would have been the case if property taxes had reacted more strongly.

Future Challenges for Local Government Finances

The Great Recession's impact on local government revenues has been large and long-lasting, and for many localities it will take a long time to recover to prerecession levels. Even when revenues do recover, local governments will face a host of future challenges that could reduce their ability to provide public services.

One major challenge is funding shortfalls for public sector pensions. The sharp downturn in the stock market during the Great Recession significantly eroded the financial standing of state and local government pension plans, as the ratio of plan assets to liabilities fell from 87 percent in 2007 to 73 percent in 2012 (Munnell 2012; Munnell, Aubry, Hurwitz, and Medenica 2013). These numbers conceal major variations across cities, however. Munnell, Aubry, Hurwitz, and

Cafarelli (2013) estimated the cost of local government pensions for residents in 173 large U.S. cities. They used a methodology similar to the FiSCs to allocate a share of pension obligations for overlying county governments and independent school districts back to the central city area and also included local government contributions to state-administered pension plans. On average, annual required contributions for pensions accounted for just 2.7 percent of own-source revenues for the least expensive cities (those in the lowest quintile) versus 12.3 percent for the most expensive cities (top quintile).

Local governments will also face growing healthcare costs. Unlike pensions, which are prefunded, retiree healthcare benefits have traditionally been funded on a pay-as-you-go basis. As a result, most local governments have very little set aside to pay future benefits. The Pew Charitable Trusts (2013b) examined 61 of the largest U.S. cities and found that in FY09 unfunded liabilities for retiree health benefits exceeded those for pensions—$118 billion compared with $99 billion. Total pension liabilities were more than three times higher than retiree health liabilities, but pensions were 74 percent funded, whereas retiree health benefits were only 6 percent funded.

In addition, many local governments will have to deal with decreases in state and federal aid as those governments address their own fiscal problems. Already, domestic discretionary spending by the federal government—about one-third of which is aid to state and local governments—has been cut significantly in a series of budget deals. In 2014, spending was budgeted 15 percent below 2010 levels, after adjusting for inflation (Bernstein 2013). Despite the recent budget deals, there are still large gaps between long-run projections for revenues and long-run projections for expenditures. Many proposals to close these gaps call for major reductions in tax expenditures, changes that could have considerable impacts on state and local governments. For example, rapid changes in the mortgage interest deduction could drive down home values and property tax revenues; changing the deduction for state and local taxes could lead to reductions in state income tax rates; and eliminating the tax exemption for municipal bonds would increase borrowing costs for state and local government infrastructure projects (Rueben 2012).

For state governments, Medicaid and other healthcare costs will continue to account for a growing share of state spending (U.S. Government Accountability Office 2013), which could crowd out other types of spending. States will also have to deal with an outdated sales tax base, which has shrunk significantly relative to the economy as the United States has moved from a manufacturing to a service-based economy (Johnson and Leachman 2013). Unless states tax a larger share of service activities, sales tax revenues are unlikely to match future growth in the broader economy.

High-profile municipal bankruptcies, including that of Detroit in July 2013, have created some concerns that local governments facing the most severe fiscal challenges will increasingly resort to bankruptcy. However, the odds that there will actually be a surge in municipal bankruptcies remain extremely low. Bankruptcy

is not even an option for many localities: only 26 states allow local governments to file for Chapter 9 bankruptcy, and 14 of them require localities to get approval from the state before doing so (Congressional Budget Office 2010).

Even if bankruptcy is allowed, the downsides of bankruptcy significantly outweigh the benefits for almost all localities. Compared with corporate bankruptcies, Chapter 9 has higher requirements to qualify and a less certain restructuring process. Chapter 9 requires that a municipality be insolvent, which is difficult to prove since governments have taxing powers. Judges cannot force municipalities to raise taxes, cut spending, or sell assets, and any restructuring plan must be approved by two-thirds of the creditors in each class. As a result, the financial benefits of restructuring may be modest and are tough to predict in advance (Congressional Budget Office 2010).

Between 2008 and 2013, only 13 general-purpose governments filed for bankruptcy, just 0.06 percent of these governments in the United States. In contrast, over the same period there were 389,278 commercial bankruptcies (Maciag 2013). Despite enduring fiscal challenges for many local governments, Standard & Poor's (2012, 3) has declared that "bankruptcies are unlikely to occur outside a very small minority of [governments] . . . and credit quality across the sector is generally stable and resilient." Of course, bankruptcy is an extreme outcome, and its low frequency is not a good measure of fiscal pressures facing local governments. The long-term challenges discussed in this chapter will deeply impact many local governments even if the number filing for bankruptcy remains low.

Conclusions

The Great Recession has had a large and long-lasting impact on local government finances. These effects have been far greater than from any other recession in the past four decades except the double-dip recession of 1980–1982. Although that recession had similarly large impacts on local finances, the declines following the most recent recession have persisted for much longer. In fact, six and a half years after its onset, local government employment was still 2.6 percent lower than it was at the start of the recession.

Local governments were largely able to muddle through the Great Recession itself, which officially ran from December 2007 to June 2009. Revenues and employment did not start declining until FY10. The delayed impact was due to lagged declines in property taxes and state and federal aid, which together account for almost two-thirds of local government revenues. On average, it takes about three years for property tax revenues to respond to changes in housing prices, largely because property tax bills are based on assessments from previous years. As a result, property taxes actually peaked in FY09 and FY10, but then fell 8.5 percent to their low point in 2012. State government revenues were propped up during the recession by about $150 billion in federal stimulus money, but most of those funds were gone by FY12, and state spending declined more in that year than at any other time since at least 1987. Although comprehensive data do

not yet exist, a variety of data sources suggest that FY12 was the low point in real per capita local government general revenues. Tying these data sources together suggests that FY12 revenues were about 5–6 percent lower than prerecession levels.

The most recent comprehensive data are for FY11, when local government revenues were 3.3 percent below FY07 levels. Up to that point, decreases in miscellaneous revenues accounted for a full three-quarters of the total decline, with those decreases driven by a 53 percent drop in interest earnings. The decline in interest earnings was partially due to local governments drawing down their reserves, but was also greatly affected by extremely low interest rates, which made it practically impossible to generate earnings from the very safe investments that localities hold. The impact of declining interest earnings was limited in cities that use compounding interest to build up their reserves, but local governments that use these earnings to fund current operations took a bigger hit.

Local government expenditures fell much more steeply than revenues after their FY09 peak, with real per capita general expenditures decreasing 6.3 percent from FY09 to FY11. Local governments drew from reserves to maintain spending in FY09, but they had to make deeper cuts starting in FY10. K–12 education bore slightly more than half of the burden of these cuts.

The impact of the Great Recession on local government finances varied widely around the country. The analysis in this chapter used data on 112 FiSCs, entities that combine city government revenues with an appropriate share of revenues from overlying county governments, independent school districts, and special districts. By FY11, more than a quarter of the FiSCs had revenue declines of more than 10 percent from their peak, but a fifth had declines of less than 2.5 percent or no decline at all. These variations were primarily due to large differences in the impact of the recession on local housing prices and incomes. The analysis found that these economic factors were about six times more important than differences in revenue structure in explaining variations in revenue declines across FiSCs during the Great Recession.

Local governments have a long way to go before they will return to prerecession revenue and spending levels, after accounting for inflation and population growth. Once they do recover, they will still face a host of future challenges, including increasing pension and healthcare costs for public sector workers and retirees, as well as the likelihood of decreased state and federal aid.

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COMMENTARY

Michael A. Pagano

There is no question that the severity of the Great Recession and the duration of its effects on markets and governments place the current era among the most significant economic dislocations among local governments in the past century or longer, exceeded only by the Great Depression of 1929–1939. During the Depression, thousands of local governments defaulted on their debts and were unable to make payroll. Government services were slashed, public employees were discharged, and tax receipts plummeted. Nearly half of the nation's banks closed, the stock market collapsed, and nearly one in four people were unemployed.[1] The Great Recession, by comparison, was not nearly as catastrophic to the economic and social fabric of society. Yet it pushed unemployment to nearly one in ten, slashed public sector payrolls sharply, and, as a result of the bursting real estate bubble, depressed the housing market substantially and weakened the financial system in its wake. These and other comparisons of the effects of that economic turmoil require policy analysts and academics to dig beneath the surface and examine the recession's effects on the economy and the public sector.

Adam Langley's careful analysis of local government finances during and after the Great Recession provides a comprehensive assessment of the effects of the 2007–2012 economic shock. He presents data that clearly identify the depth of that recession compared with the previous four recessions, demonstrating that in 2013 local government employment was still 3 percent less than it was at the start of the recession more than six years earlier. Data also illustrate that real per capita local government revenues from 2008 through 2013 declined, including revenues from property taxes, non-property taxes, state and federal aid, and other miscellaneous sources. The only category in which revenues increased was user charges. In other words, the broad categories of tax resources and intergovernmental aid had not rebounded to 2007 levels by 2013, yet local governments had increased user charges substantially as a mechanism to stanch the bleeding. Growth in user charges, which has been documented in other studies, continued to accelerate through the postrecession era.[2] According to Langley's data, local governments' general expenditures declined for all categories between 2009 and 2011, and they reduced personnel-related spending for at least four consecutive years. Property tax receipts for all local governments also declined between 2010 and 2012, though not nearly as precipitously as housing prices, and then stabilized in 2013.

1. Comparisons of the economic conditions during the Great Depression and the Great Recession can be found in Pagano (2014).

2. User charges have grown at a steady rate since the post–Proposition 13 era (Pagano 2010).

The second part of Langley's chapter was informed by the Fiscally Standardized Cities (FiSC) data set for 112 U.S. cities. The data base is constructed by summing all overlapping local governments' revenues for each city. In this way, a measure of the tax burden on city residents is created based on the total costs of all local governments to which residents contribute taxes and fees. Comparing how fiscally standardized cities (FiSCs) have responded to the Great Recession is an interesting exercise in understanding the shifting revenue burden on urban residents, but it does not explore how the various overlapping governments' revenue structures behave as individual governments. Langley concedes that the FiSCs "are poorly suited for studying policy changes made by individual governments." That is to say, local governments have the authority and autonomy to adjust and adapt to changing circumstances. Although they may take tax policy cues from proximate and overlapping governments, they are ultimately responsible to their own electorate (or governing board) and behave in a manner that meets their needs.

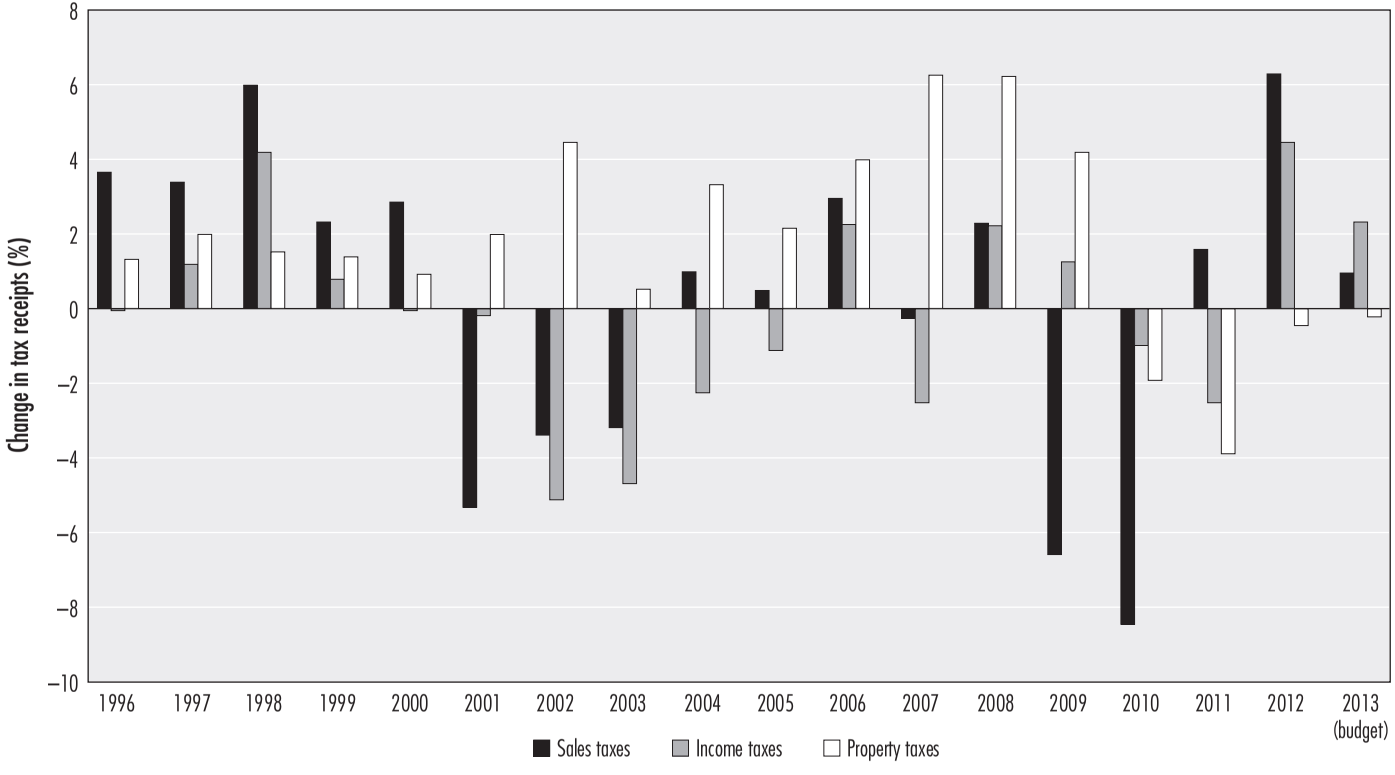
It is the variation among local governments that makes comparisons among them, analyses of tax policy, and aggregations of data in a decentralized polity so challenging and interesting. Indeed, data on the annual changes in cities' general funds—which have been collected annually since 1989 from a sample of cities across the country—provide an interesting overview of revenue and expenditure trends throughout the years.[3] But because they are presented in aggregate form, the trends ignore the variations. To illustrate the importance of differences in revenue structures among cities, the general fund data collection exercise disaggregated the general tax source into three broad categories beginning in 1996 (figure C6.1). Trends in property, sales, and income tax revenue contributions to the general fund certainly present a more varied picture of cities' fiscal conditions, especially because nearly one in ten cities is allowed by law to impose an income or payroll tax and more than half of all U.S. municipalities collect a sales tax. Changes in the underlying economy, therefore, have different impacts on revenue generation depending on the revenue reliance of municipal governments.

Moreover, as an ongoing project called the Fiscal Policy Space indicates, cities' fiscal policy behavior is constrained by a variety of factors.[4] The following five critical attributes constrain the behavior of city officials: (1) the intergovernmental context, principally the state that allows/disallows municipal access to general tax sources, state-imposed tax and expenditure limitations, and state aid to support municipal operations; (2) the economic base of the municipality;

3. An annual report on city fiscal conditions has been published by the National League of Cities since 1986. See, for example, Pagano and McFarland (2013).

4. The Fiscal Policy Space is a project of the Great Cities Institute at the University of Illinois at Chicago (*http://fiscalpolicyspace.greatcities.uic.edu/*). This concept was first explored in a project supported by the Lincoln Institute of Land Policy (Pagano and Hoene 2010).

Figure C6.1
Change in General Fund Tax Receipts in Constant Dollars (%)



Source: Pagano and McFarland (2013).

(3) locally imposed tax and expenditure limitations; (4) consumer/citizen demand and preferences for service levels; and (5) the local political culture. Each of these attributes alone or in combination with one or more of the others can shrink or expand the policy space within which mayors and city councils operate, allocate resources, and take appropriate fiscal policy action. Because the size of the fiscal policy space is shaped by these independent factors, each city's space is unique. Consequently, the FPS framework's design highlights the uniqueness of each municipality and underscores the variations in behavior across the municipal sector. Variation, then, is the key descriptor of city fiscal behavior, as it is of all local governments.

Langley describes data that show the depth of the Great Recession and the toll it has taken on local governments. He also examines aggregate fiscal data for 112 FiSCs and concludes that local housing prices and personal income explain most of their variations in revenues. Further exploration of this finding, as well as a thorough understanding of the variations in city fiscal behavior, could facilitate understanding of urban adaptation, change, and survival issues. Indeed, it is the differences among local governments that make studies of public finances in the American federal system so interesting and dynamic. Vive la différence!

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Housing Finance

7

Foreclosures and Neighborhoods: The Shape and Impacts of the U.S. Mortgage Crisis

Dan Immergluck

The U.S. mortgage crisis beginning in 2007 resulted in very high levels of foreclosures in many neighborhoods around the country. In addition to harming individual households, foreclosures had negative spillover effects on nearby properties and households, including lower property values and higher crime rates. To understand the effects of foreclosures on households and neighborhoods, it is important first to understand the demographic and geographic distributions of foreclosures and how they may have changed during the foreclosure crisis, which persisted for more than five years, from 2007 to beyond 2012. Spurred in part by the crisis, dozens of studies have been published on the effects of foreclosures on neighborhoods; somewhat fewer studies have systematically examined the intrametropolitan morphology of the crisis, including how this morphology varied across metropolitan areas and over time. This chapter first reviews the geographic incidence and concentrations of foreclosures, and then reviews evidence of the impacts of foreclosures on households and neighborhoods.

The Racial and Spatial Dynamics of Subprime Lending and Foreclosures

LENDING PATTERNS BY RACE AND SPACE

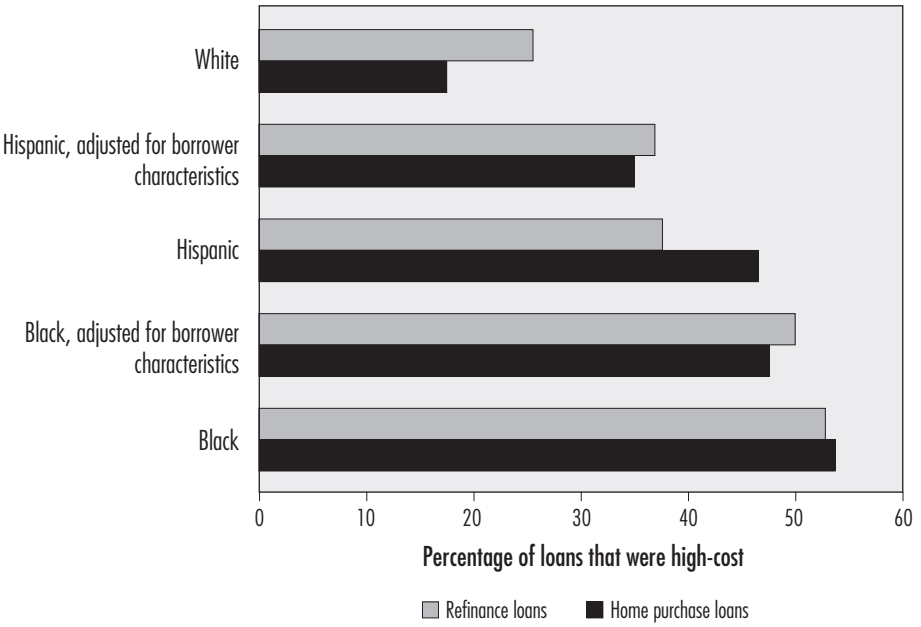
With the rise of the subprime mortgages in the 1990s, the problems of discrimination and redlining in mortgage markets evolved into a new shape and scale. While basic access to institutional mortgage credit remained an issue, the rise of high-risk subprime lenders created wider problems in the pricing and terms of

mortgages. Some of the earliest work documenting the segmentation of the mortgage market across race and space came from Chicago, the birthplace of Community Reinvestment Act activism. This research showed that the number of refinance loans made in predominantly black neighborhoods grew almost thirtyfold from 1993 to 1998, while subprime refinance loans in predominantly white neighborhoods grew by about twofold (Immergluck and Wiles 1999). By 1998, the largest lenders in predominantly black neighborhoods were specialized subprime firms, while the top originators in predominantly white neighborhoods were prime lenders. Shortly thereafter, the U.S. Department of Housing and Urban Development (HUD) analyzed lending patterns in the United States, paying special attention to five large cities, and found that subprime lenders dominated black neighborhoods (U.S. Department of Housing and Urban Development 2000). Later analyses continued to document segmented home loan markets in cities throughout the country, finding that subprime lending was disproportionately concentrated in minority neighborhoods (Bradford 2002; Scheessele 2002). Scheessele (2002) and Immergluck (2004) both found that the racial composition of a neighborhood was strongly associated with the concentration of subprime lending, even after they accounted for other neighborhood housing and economic characteristics.

In the aftermath of the 1990s subprime boom, researchers also found that the race of the borrower had a significant effect on the likelihood of him or her receiving a subprime versus a prime loan, even after they controlled for credit history and other variables. For example, a study of home loans conducted by an affiliate of the Mortgage Bankers Association found that the probability of a borrower receiving a subprime loan increased by approximately one-third when the borrower was black, even when controlling for credit history, location, and other variables (Pennington-Cross, Yezer, and Nichols 2000).

Additional research has documented the relationship between race and subprime lending during the 2000s. Based on calculations of researchers at the Federal Reserve Board, figure 7.1 shows the differences among whites, Hispanics, and blacks in their likelihood of receiving subprime loans in 2006, at the height of the subprime boom (Avery, Brevoort, and Canner 2007). For the United States as a whole, more than 53 percent of black home buyers and more than 52 percent of blacks refinancing their homes received subprime loans. Moreover, black home buyers were three times more likely to receive a subprime loan than white home buyers. Even when researchers adjusted for variations in subprime incidence due to differences in income, loan size, metropolitan statistical area, gender, and the presence of a co-applicant, they found that most of this differential persisted, with the adjusted rate for blacks still being about 2.7 times the rate for whites. Almost half of Hispanic home buyers in 2006 also received subprime loans. While the difference between Hispanics and whites declined somewhat after researchers controlled for these factors, the adjusted differential remained sizable, at approximately 2 to 1.

Figure 7.1
High-Cost (Subprime) Lending Incidence by Race of Borrower, 2006 (%)



Note: Adjusted for income, loan size, presence of co-applicant, metropolitan statistical area, and gender.
Source: Data from Avery, Brevoort, and Canner (2007).

Similarly, Wyly and Ponder (2011) reported large disparities in the likelihood of different racial and ethnic groups receiving subprime loans. For example, they found that in 2006, single black women were more than four times as likely to receive subprime loans as white couples and more than three times as likely to receive subprime loans as single white women.

Faber (2013) examined home purchase loans that originated nationally in 2006, controlling for borrower income, neighborhood racial and income composition, regional and metropolitan location, and the presence of a co-applicant. He found that blacks and Hispanics were 2.4 times more likely to receive subprime loans than whites. Moreover, Faber determined that higher-income blacks and Hispanics were more likely to receive subprime loans than lower-income minorities, while higher-income whites were less likely to receive subprime loans than lower-income whites. Some of this difference may have been due to higher property values associated with higher-income versus lower-income minority homeowners.

Moreover, higher-income whites may have been better served by prime financial institutions than higher-income minorities, leaving them less vulnerable to aggressive subprime lenders.

The racial patterns of subprime lending were also present at a spatial level, as predominantly minority neighborhoods were much more likely to see high levels of subprime loans than other neighborhoods. Kingsley and Pettit (2009) found that the density of subprime loans at a neighborhood level was highest in black and Hispanic neighborhoods during the subprime boom period, from 2004 to 2006. They also found that the highest subprime densities were in relatively low-poverty, high-minority neighborhoods. This finding might be related to the relatively higher-value housing stock in lower-poverty census tracts.

Mayer and Pence (2008) focused on the spatial distribution of subprime lending in 2005. Using loan data from Loan Performance (now known as CoreLogic), they found that subprime lending in predominantly black and Hispanic zip codes was much higher than in other areas, even after controlling for credit scores and other economic characteristics of the zip codes. Similarly, Calem, Hershaff, and Wachter (2010), analyzing home loans in seven major cities in 1997 and 2002, found that blacks were more likely than whites to receive subprime loans, even after controlling for borrower income and a variety of neighborhood characteristics, including educational level and average credit score.

Gruenstein-Bocian, Ernst, and Li (2008) were among the first to combine publicly available Home Mortgage Disclosure Act (HMDA) data (including data on borrowers' race and income) with private data from a major loan data vendor (including information on loan terms and credit quality). They found that African American home buyers were 31 percent more likely to receive a high-rate fixed-rate mortgage with a prepayment penalty than white borrowers with similar loan and personal characteristics, including similar credit scores.

Gruenstein-Bocian et al. (2011) found that racial disparities in receiving subprime loans during the peak of the subprime boom were actually greater among borrowers with higher credit scores. This was consistent with an earlier, well-publicized analysis by the *Wall Street Journal* suggesting that many subprime borrowers could have qualified for prime loans based on their credit scores (Brooks and Simon 2007). These studies added to concerns that there had been systematic—and perhaps intentional—steering of minorities toward higher-cost and riskier subprime loans.[1] In particular, Apgar, Bendimerad, and Essene (2007) found that the probability of receiving a subprime loan was heavily dependent on the particular lending channel through which the borrower received the loan.

1. Consumer advocates argued that yield-spread premiums, in particular, encouraged mortgage brokers to steer borrowers toward high-cost loans. A disproportionate level of mortgage broker activity in minority communities and/or a higher vulnerability to such steering among minority borrowers could have contributed to the prevalence of minorities who had good credit receiving subprime loans.

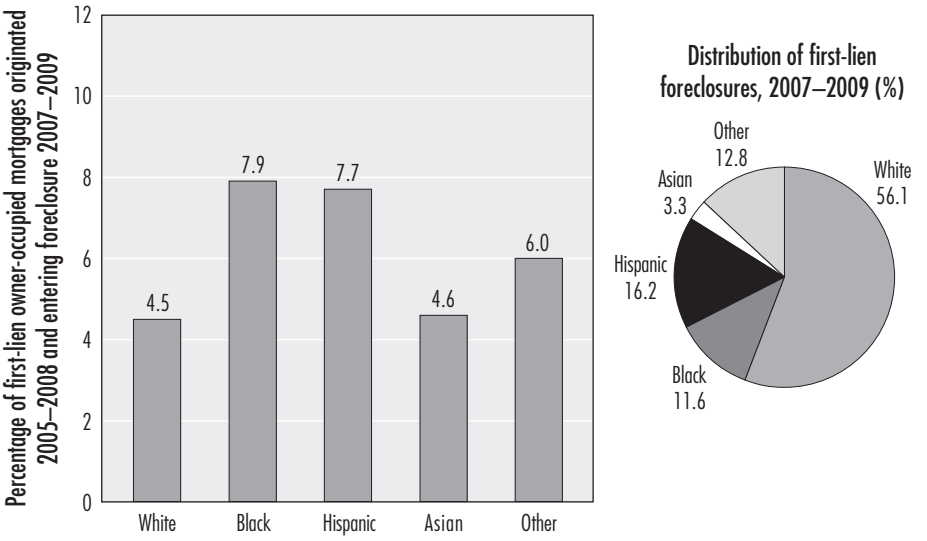
For example, in comparing the customers of a traditional prime lending unit and a specialized subprime lending unit owned by the same financial firm, they found that a borrower receiving a loan through the subprime channel was much more likely to receive a subprime loan (even if he or she could qualify for a prime loan—a loan that the lender could make or could help the borrower obtain) than a similar borrower obtaining a loan via the prime lending channel. The channel that the borrower happens to enter the parent firm through (often due to marketing from one unit or the other) determines the pricing and terms of credit, rather than the qualifications of the borrower.

Researchers at the Federal Reserve Bank of Philadelphia combined HMDA data with information from a national proprietary data set on loan and borrower characteristics for three states (Pennsylvania, New Jersey, and Delaware) from 1999 to 2007 (Smith and Hevener 2014). As in the work of Gruenstein-Bocian and associates (Gruenstein-Bocian, Ernst, and Li 2008; Gruenstein-Bocian et al. 2011), combining HMDA data with loan-level data on borrower credit scores and loan terms provided a rich, multivariate, loan-level analysis. Smith and Hevener (2014) found that blacks had a high probability of receiving subprime versus prime loans during all years studied. They also estimated the difference in the likelihood of whites and blacks receiving subprime loans due to factors other than race, including income, credit score, neighborhood characteristics, and loan characteristics, among others. At most, these factors explained only two-thirds of the higher likelihood of blacks receiving subprime loans in 2005. This left one-third of the difference due solely to race, suggesting the likelihood of discriminatory forces in determining who received subprime loans. Researchers in other locations using data sets containing information on loan terms and credit scores found similar results (Courchane 2007; Reid and Laderman 2009).

FORECLOSURE PATTERNS BY RACE AND SPACE

Minority homeowners were disproportionately impacted by foreclosures, especially in the earlier years of the crisis, when subprime loans accounted for the bulk of the problem. Gruenstein-Bocian, Li, and Ernst (2010) analyzed foreclosures between 2007 and 2009, at the height of the initial, subprime phase of the foreclosure crisis. They estimated that owner-occupied homes accounted for approximately 80 percent of all foreclosures and that black and Hispanic homeowners were disproportionately impacted. Figure 7.2 presents some of the findings from their study. Almost 8 percent of first mortgages to black homeowners that originated between 2005 and 2008—the height of the subprime lending boom—went into foreclosure between 2007 and 2009, compared with only 4.5 percent for whites. That means the black foreclosure rate was 76 percent greater than the white rate. Similarly, the foreclosure rate for Hispanic homeowners was 7.7 percent, or 71 percent greater than the white rate. Even so, because whites accounted for a majority of borrowers during that time, they also accounted for more than half of all foreclosures. Blacks and Hispanics together accounted for about 28 percent of foreclosures, with Asians and other ethnicities accounting

Figure 7.2
Foreclosure Rates for Owner-Occupied Homes by Race and Ethnicity, 2007–2009



Note: Data are for first-lien owner-occupied mortgages originated in 2005–2008 and entering foreclosure in 2007–2009.
Source: Gruenstein-Bocian, Li, and Ernst (2010).

for the remaining portion. Yet while the subprime crisis disproportionately affected black and Hispanic homeowners, it was not confined to people of color, even in the early stages. Later, as foreclosures spread to the prime market and consequently to a broader set of middle-income and majority-white communities, whites accounted for an even larger portion of foreclosures in most regions.

During the foreclosure crisis, media reports fluctuated between describing foreclosures as primarily affecting central city neighborhoods (Whitehouse 2007) and describing them as being concentrated in newer suburban or exurban areas (Farrell 2008). The evidence on the intrametropolitan distribution of the crisis is somewhat more complicated than either of these simplistic narratives would suggest, with many inner-city neighborhoods and many newly developed suburban areas both being hit hard. This dichotomy was driven in large part by the opportunistic nature of the subprime mortgage boom. High-risk credit flowed disproportionately both into vulnerable inner-city neighborhoods, where mortgage brokers aggressively marketed home loans, especially refinance loans, and into newly developing suburban and exurban communities, where home ownership was attainable but perhaps not always sustainable, especially in the event of economic hardships.

Due to differences in the geography of housing, income, and race among metropolitan areas, as well as to differences in the penetration of the subprime lending industry from city to city, the neighborhood distribution of foreclosures varied a good deal across metropolitan areas. Which neighborhoods were hit hardest by the crisis depended on the particular economic and housing geography of the metropolitan area. More specifically, the incidence and concentration of foreclosures depended not only on the spatial determinants of default and foreclosure but also on the geographic distribution of subprime and high-risk loans. Immergluck (2010a) showed that in many older industrial metropolitan areas with traditionally weaker economies and housing markets, such as Detroit and Cleveland (but also some cities with stronger regional economies, including Atlanta and Chicago), subprime delinquencies and foreclosures had been increasing well before 2007. By the first quarter of 2006, subprime delinquency rates had already exceeded 12 percent not only in states with more troubled economies, such as Pennsylvania, Michigan, Ohio, and Indiana, but also in states such as Georgia and Tennessee. Until late 2006, regions with very hot housing markets experienced low delinquency rates, with California, Arizona, and Nevada having subprime delinquency below 6 percent. This was partly due to the fact that borrowers struggling with their mortgages in hot markets could avoid default or foreclosure by quickly refinancing or selling their homes. By the summer of 2007, however, after appreciation had stalled in most places, delinquency and foreclosure rates were accelerating in most large metropolitan areas, with the steepest increases in markets where housing values were also rapidly declining.

As discussed earlier, subprime lending was disproportionately concentrated among minority homeowners, so higher levels of subprime foreclosures could be expected to occur in predominantly minority neighborhoods, which comprise many inner-city communities. At the same time, subprime and high-risk lending also helped fuel rapid growth in newer suburban and exurban communities, especially in parts of the Southwest, California, and Florida (Ong and Pfeiffer 2008; Schafran and Wegman 2012; Schildt et al. 2013). Some media reports and commentary, however, portrayed the crisis as one exclusively centered in a new "slumburb" and ignored the fact that it was also heavily concentrated in many older urban neighborhoods (Leinberger 2008).

One of the few studies of neighborhood-level foreclosure patterns across a wide variety of metropolitan areas examined changes in the prevalence of foreclosed properties at the zip code level in 75 large metropolitan areas (Immergluck 2010b). This study analyzed the share of single-family properties (including townhomes and condominiums) that had been foreclosed on and repossessed by lending institutions, instead of measuring foreclosures by comparing foreclosures with housing units. Many other estimates of foreclosure prevalence have effectively assumed that each housing unit equates to a "mortgageable" property, a grossly inaccurate assumption in neighborhoods with many multifamily rental units.

Based on an earlier study (Immergluck 2010a), U.S. metropolitan statistical areas (MSAs) were classified into three categories of foreclosure activity. Type 1

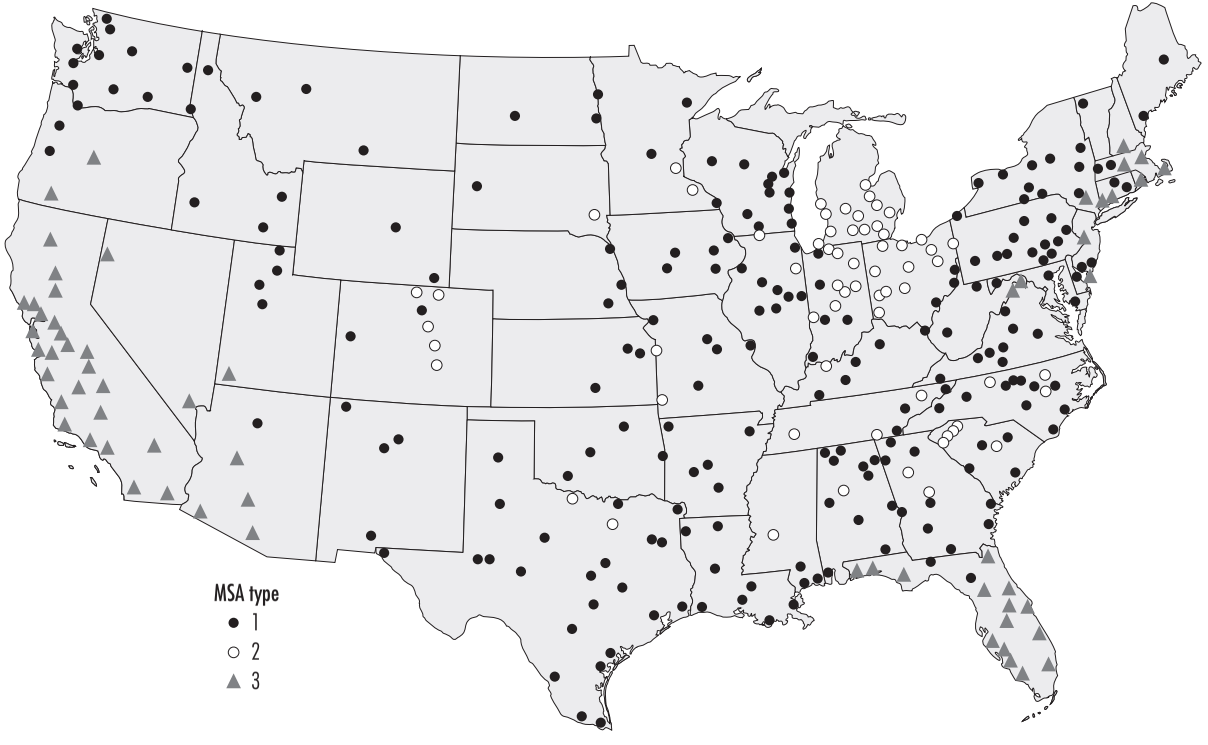
metros were those in which housing prices had remained relatively stable and foreclosure levels had not been large prior to the advent of the crisis in 2007. Type 2 metros were mostly older metropolitan areas where foreclosures had already reached relatively high levels before the crisis. Type 3 metros were the "boom-bust" areas that had very low foreclosure rates before 2007 but began experiencing sharp declines in housing prices after 2006. Figure 7.3 shows the locations of the three types of metros. Type 1 metros were scattered across the country and included most smaller metropolitan areas and many areas in the Great Plains and Rocky Mountain regions, where the crisis tended to be less severe. Type 2 metros included most larger metropolitan areas in the upper Midwest, as well as some (mostly larger) metros in Colorado and the Southeast. Type 3 metros were clustered in California, Florida, and Nevada (including Las Vegas) and Arizona (including Phoenix), as well as along the East Coast.

Regression results showed that from 2006 to 2008, zip codes in MSAs with falling median home values experienced substantial increases in foreclosed properties, even after controlling for a wide variety of other differences in housing market conditions and local foreclosure processes. Greater increases in unemployment also resulted in greater increases in foreclosures.

The prevalence of outstanding subprime mortgages in 2006 was a strong predictor of increases in foreclosure rates. For every 1 percent increase in the share of subprime mortgages, the number of foreclosed properties increased by 4 percent on average over the following two years. The number of junior—or subordinate—mortgages outstanding at the end of 2006 was also positively associated with the growth in the number of foreclosures from 2006 to 2008. Another key finding was that, other things being equal, zip codes with large numbers of recently constructed homes experienced greater increases in foreclosures. This may be due to the fact that large shares of homes in such areas were financed during the peak of the subprime boom. At the same time, zip codes with higher poverty rates experienced more foreclosures. In sum, the findings confirmed that the subprime foreclosure crisis was concentrated both in higher-poverty (often inner-city) neighborhoods and in many newer, sprawling communities.

Further analysis showed that neighborhood-level foreclosure patterns varied across the two types of metropolitan areas that experienced the brunt of the crisis—Type 2 and Type 3 metros. In general, Type 3 metros tended to see more suburbanized foreclosure patterns, especially when central city neighborhoods were relatively affluent, such as in San Diego and San Francisco. In addition, unemployment was a bigger driver of increased foreclosures in Type 2 versus Type 3 cities, which is consistent with the notion that foreclosures in many Type 2 communities may have been driven more by weaknesses in the broader economy than was the case in Type 3 areas, where overheated housing markets fueled by subprime credit were rapidly deflating. Finally, and important, the results showed that neighborhoods with newer housing in Type 3 metros were particularly vulnerable to increased foreclosures, which is consistent with the idea that areas that experienced high levels of subprime lending near the peak of the boom also

Figure 7.3
U.S. Metropolitan Statistical Areas by Foreclosure Market Type



Source: Immergluck (2010a).

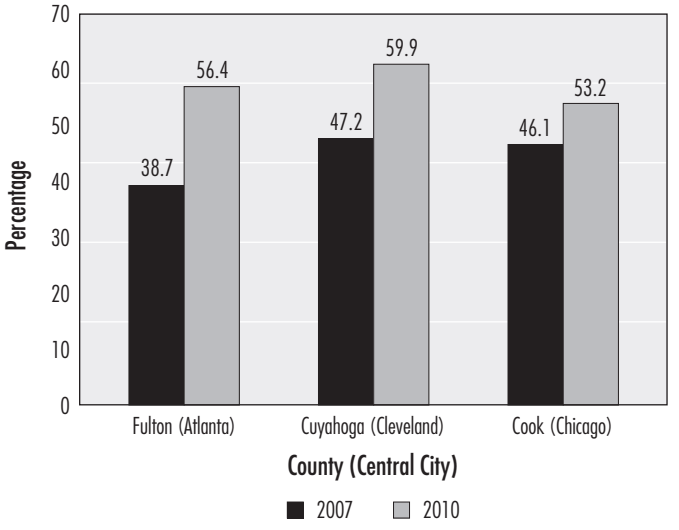
experienced particularly high levels of foreclosures. This occurred in Type 2 metros as well, but not to the same degree.

Schildt et al. (2013) examined the extent of the foreclosure crisis in suburban areas of the 100 largest U.S. metros. Their findings were generally consistent with those of Immergluck (2010b): suburban mortgage distress was highest in boom-bust metros, especially in inland California and Florida, while suburban areas in older industrial cities were not hit as hard. This reflects the distribution of subprime lending in 2004–2008, as these loans were also likely to be more available in suburban and exurban areas of boom-bust metros.

THE SUBURBANIZATION OF THE FORECLOSURE CRISIS OVER TIME

As the subprime foreclosure crisis triggered the Great Recession, and as the mortgage and housing markets became weaker, many homeowners with well-priced, well-structured prime home loans began to find themselves in mortgage distress. Many lost their jobs due to the recession, especially those working in industries and regions that were vulnerable to the crash of the real estate market and, later, the broader economy. By 2010, with housing prices having declined significantly in most major metropolitan areas and many homeowners' equity having been eroded by mounting declines in home values, millions of prime borrowers found

Figure 7.4
The Suburban Share of Foreclosure Filings for Three Major Metropolitan Counties, 2007 and 2010



Sources: Hexter and Schnoke (2011); Woodstock Institute (2008, 2011); author's calculations based on Fulton County foreclosure notices.

themselves underwater on their mortgages (that is, their homes were worth less than they owed on their mortgages). As a result, any substantial economic shock, such as a job loss or health issue, could lead to foreclosure. In the meantime, an increasing share of subprime borrowers had already lost their homes, so that the share of foreclosures associated with subprime loans began to decrease over time.

Figure 7.4 demonstrates that in three major urban counties—Fulton (Atlanta), Cuyahoga (Cleveland), and Cook (Chicago)—the number of foreclosure filings (or notices) that occurred in the suburban parts of the counties grew significantly over a relatively short period of time, from 2007 to 2010. The suburban share grew the most, from 39 percent to just over 56 percent, in Fulton County, where there are many working-class suburbs to the south of Atlanta. Over the same period, the suburban share grew from 47 percent to 60 percent in Cuyahoga County and from 46 percent to 53 percent in Cook County.

The Impacts and Costs of Foreclosure and the Foreclosure Crisis

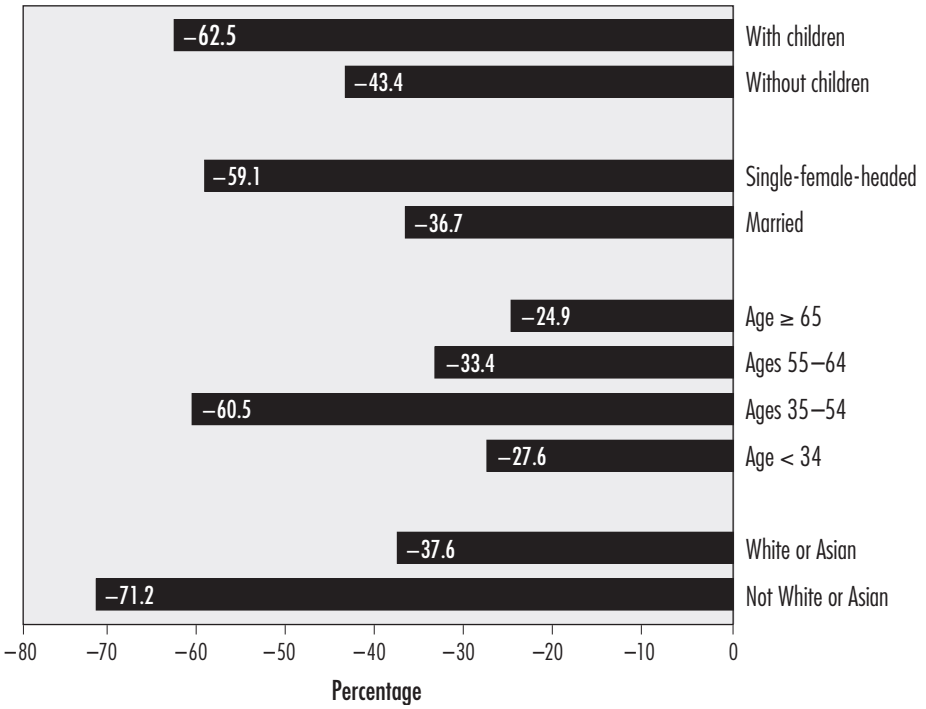
The mortgage crisis brought financial pain to millions of American households. It uprooted families from neighborhoods and social networks, forced kids to change schools in the middle of the year, and created strains on mental and physical health, which in some cases triggered additional financial hardships. The costs of the crisis went well beyond impacts on borrowers, significantly affecting local property values and causing vacancy and blight, as well as the crime that often follows. As property values deteriorated, neighbors saw the equity in their homes decline, which made them more susceptible to foreclosure, as homes became harder to sell or refinance. This section describes the literature on the harms that arose due to mortgage distress and foreclosure. Not addressed are the wider macroeconomic effects of the foreclosure crisis, which catalyzed the Great Recession and the global financial crisis.

DIRECT HARMS TO FORECLOSED HOUSEHOLDS

Foreclosure has direct effects on households and individuals. Perhaps most obvious is the loss of the home itself and the need to relocate, often quickly and under far-from-optimal conditions. Of course, beyond this is the potential loss of wealth if the family had built up significant equity in the home. As suggested earlier in this chapter, the foreclosure crisis especially spurred losses in home equity and decreased home ownership rates among people and communities of color.

Figure 7.5 shows that the net worth of households declined substantially from 2007 to 2011 and that the loss of wealth varied significantly across demographic groups. This was due to variations in decreases in home values and to the fact that the stock market, which generally constitutes a larger share of the household wealth of higher-income, older, and nonminority households, recovered significantly from 2008 to 2011, while home values in many places did not.

Figure 7.5
Changes in Real Net Worth by Demographic Group, 2007–2011 (%)



Source: Based on estimates in Pfeiffer, Danziger, and Schoeni (2013).

As figure 7.5 indicates, whereas white and Asian households lost 38 percent of their net worth from 2007 to 2011, households that were not white or Asian lost 71 percent of their net worth. This difference reflects the disproportionate concentration of subprime loans among black and Hispanic homeowners. Households in the 35- to 54-year-old range also lost far greater shares of their wealth than older households—61 percent of their net worth compared with 25 percent for those age 65 or older. Some of this difference is likely due to the geography and timing of home buying among the younger age group, especially those purchasing homes in boom-bust areas, where values were temporarily boosted by the surge in subprime and high-risk lending.

The foreclosure crisis forced many families out of home ownership and into the rental market. Certainly, home ownership is not the best form of tenure for all families at all times. However, in many places in the United States and especially for families with children, home ownership—if responsibly financed—can bring

significant benefits compared with renting. It can provide a sense of stability and control, allowing for predictable and relatively fixed housing costs (especially assuming access to a long-term, fixed-rate mortgage), and it can give families more neighborhood options, including those with strong schools. Moreover, rapid declines in home ownership rates could have negative impacts on neighborhoods in which it may have helped provide more stability to the area.

While home ownership rates overall declined somewhat moderately from its peak in late 2004 and early 2005, the decline among certain demographic groups was significantly greater. From 2005 to 2012, the home ownership rate for blacks declined more than 5.5 percentage points, whereas it dropped only 2.5 percentage points for whites (Joint Center for Housing Studies 2013). Consistent with the loss-of-wealth figures cited earlier, the home ownership rate of households ages 25–44 fell almost 8.5 percentage points, while it stayed essentially flat for those age 65 and older. Finally, as with the wealth figures, families with children were hit particularly hard: married couples with children saw home ownership decline 7 percentage points, compared with married couples without children, who saw a decline of less than 2 percentage points.

Foreclosure has a direct impact on creditworthiness. Brevoort and Cooper (2010) found that the credit scores of prime and near-prime borrowers who had gone through foreclosure during the early years of the crisis dropped by 170–200 points compared with their predelinquency scores. They moved rapidly into becoming subprime borrowers. Moreover, it generally takes many years for credit scores to rebound. Even seven years after a foreclosure, scores tend to remain 50–75 points below where they were before foreclosure, despite the fact that the foreclosure can no longer be considered in calculating scores.

Lower credit scores have critical implications in an age when they are used by employers in evaluating job applicants, landlords in assessing potential tenants, and insurance companies in underwriting and pricing automobile insurance. According to the Fair Credit Reporting Act (FCRA), any firm that delivers a good or service prior to receiving payment is effectively acting as a creditor and is allowed access to credit reports and scores. Utilities providing electricity, water, gas, phone, or cable TV often use credit bureau data. As early as 2002, TransUnion, one of the three large credit bureaus, reported that banks and credit unions had been overtaken as the largest users of credit data in the Philadelphia region by nonbank entities such as hospitals, telecommunication firms, and utilities (Furletti 2002).

A substantial drop in credit scores, such as that caused by a foreclosure, has the potential to create a web of barriers to employment, quality housing, and basic goods and services. For example, the bulk of auto insurers use credit scores in underwriting and pricing new policies, although some states prohibit this practice (Hartwig and Wilkinson 2003). In many lower-income neighborhoods, auto insurance rates are already high, so a lower credit score may make use of an automobile prohibitively expensive, which in turn could limit employment opportunities. As landlords have increasingly relied on credit scores, postforeclosure

households needing rental housing may have been excluded from the full array of housing choices. Given the scarcity of affordable, decent rental housing in many metropolitan areas, this could make quality housing even more difficult to obtain. Compounding the damage of a lower credit score is the fact that employers have increasingly turned to credit data in screening job applicants. In a survey of more than 500 human resource managers, the Society for Human Resource Management (2012) found that 47 percent of employers used credit background checks in making hiring decisions.

Beyond direct financial and economic harm, the foreclosure crisis forced some children to change schools. Especially when this happens in the middle of the school year, it can stunt academic achievement, an effect that can last for years. In a study of Minneapolis during 2006–2007, Allen (2013) found that more than 90 percent of households moved after a foreclosure, with most changing neighborhoods and almost a third leaving the Minneapolis Public Schools district entirely. In a similar study of students in New York City, Been et al. (2011) found that students living in properties that went through a foreclosure were likely to move to a different, lower-performing school. And in a study of the San Diego school system during 2001–2010, Dastrup and Betts (2012) found that the math test scores and attendance rates of children in owner-occupied homes declined in the year following a mortgage default and that these effects persisted after they controlled for a wide variety of student and school characteristics.

While direct evidence on the effects of foreclosure on children continues to emerge, there is already a large body of literature on the effects of residential instability that can help us understand the costs that foreclosure imposes on families. Sandstrum and Huerta (2013) reviewed much of the literature and found that "the experience of abrupt or frequent residential moves is stressful for children since it requires them to detach themselves from what they know and adapt to new surroundings" (29). They documented the considerable evidence that chaotic environments can have negative effects on children, including their scholastic outcomes. One longitudinal study of children from birth through age nine, which controlled for a large number of demographic characteristics, found that moving two or more times during the first two years of life increased the incidence of problems such as anxiety, sadness, and withdrawal at age nine (Rumbold et al. 2012). Another study found that moving before age four led to increased problem behaviors at that age, even after controlling for child and family characteristics (Taylor and Edwards 2012).

In a longitudinal study of almost 5,000 children born in 20 large cities between 1998 and 2000, Ziol-Guest and McKenna (2013) found that children who moved three or more times in the first five years of life had greater attention problems than those who did not move; this difference remained significant after they controlled for a large number of demographic and household characteristics. High levels of mobility also resulted in negative behavioral problems, and the magnitude of the effect was larger than that for any other independent variable, including race, ethnicity, parental education, and family structure, among others.

In particular, residential instability has been shown to affect school performance adversely. Taylor and Edwards (2012) found that five-year-olds who had moved five or more times since birth had vocabulary scores 41 percent of a standard deviation below average. Other studies have demonstrated that residential instability tends to result in lower grades, lower high school graduation rates, and lower adult educational attainment (Adams and Chase-Lansdale 2002; Coulton, Theodos, and Turner 2009; Sell et al. 2010; Ziol-Guest and Kalil 2013).

Studies in two different cities (Chicago and Baltimore) found similar effects of school transfers on academic achievement (Alexander, Entwisle, and Dauber 1996; Temple and Reynolds 1999). For each school transfer, achievement scores declined by approximately one month of school, even after the researchers controlled for other factors. In a meta-analysis of the literature, Reynolds, Chen, and Herbers (2009), controlling for demographic and family characteristics, found that school mobility reduced reading and math achievement, as well as high school dropout rates. They also found that the negative effects of mobility increased with each additional move, with effects during the early elementary and high school years having the largest negative impacts on learning outcomes.

In some of the earliest research on the relationship between foreclosure and health, Fields et al. (2007) studied 88 families going through foreclosure in five cities around the country. They found that those families incurred a wide range of attendant hardships and emotional difficulties, including harm to children's physical and mental health and trouble with their finances and credit histories. Many respondents felt shame, which sometimes discouraged them from seeking support services or even assistance from friends and family. According to Fields et al. (2007), foreclosure harmed family stability and made it difficult for families to make long-term plans. In some cases, foreclosure represented a "cascading series of economic and emotional losses that interfere with people's day-to-day lives." Many respondents took on additional employment to try to resolve delinquencies. More broadly, foreclosure sometimes led to increases in "fear, tension, and stress" among family members.

Foreclosure has been found to be closely associated with poor health among all family members. Because foreclosure can be both the result of poor health (and its associated expenses and loss of employment) and a potential cause, it is often difficult to determine the causal role it might play. A study in Philadelphia found that clients of a mortgage counseling agency who were undergoing foreclosure had high rates of depression, hypertension, and heart disease (Pollack and Lynch 2009). Overall, almost 37 percent of these clients suffered from major depression. In a study of hospital visits and foreclosures in four states, Currie and Tekin (2011) found that a spike in neighborhood foreclosures was associated with significant increases in unscheduled hospital visits, even after controlling for changes in unemployment, housing prices, migration, and other factors.

Longitudinal data allow for more precise measurement of the causal effects of foreclosure on physical and mental health. Alley et al. (2011) examined the results of a national longitudinal survey of adults over age 50 during the 2006–2008

period. Even after controlling for a wide variety of demographic, financial, and health variables, they found that mortgage delinquency was a strong predictor of negative changes in physical and mental health. Delinquent borrowers were almost eight times as likely to develop elevated depression compared with non-delinquent borrowers. They were also almost eight times as likely to develop food insecurity and almost nine times as likely to develop cost-related medication nonadherence.

Foreclosure and residential instability may be particularly hard on the elderly or near-elderly. The elderly can be especially adversely affected by forced relocations (Danermark and Ekstrom 1990; Smith and Ferryman 2006). Seniors may be particularly dependent on social networks and relationships for their day-to-day living circumstances and may be emotionally and psychologically less resilient to involuntary stressors and changes.

COSTS TO NEIGHBORHOODS AND COMMUNITIES

Foreclosures can impose economic and social costs on surrounding neighborhoods and larger communities. Because housing is such a large part of the economy, home values have a direct effect on household wealth and expenditures, and mortgage market problems can—especially in less regulated environments—spread rapidly to broader credit and capital markets. High levels of foreclosures across the country can also trigger major problems in national and international financial and employment markets (Levitin and Wachter 2013). The focus here, however, is on neighborhood and local effects.

Foreclosure might lower not only the value of the foreclosed home but also the value of nearby homes, which in turn can result in lower property tax collections and attendant fiscal stress. The mechanisms through which this can happen have generally been disaggregated into three types. First, foreclosures represent an increase in housing supply, and especially if they increase quickly, they can effectively create a "supply shock" in a neighborhood housing submarket, putting downward pressure on prices.

Second, the discounted prices at which foreclosed homes tend to sell may change the nature of comparable sales used by home buyers and appraisers to determine the value of available homes. If foreclosures become a sizable share of home sales, as they often did in hard-hit neighborhoods during the foreclosure crisis, and there are few traditional "arms-length" sales in an area not involving banks or servicers, appraisers may be effectively forced to consider real estate owned (REO) sales in the appraisal process (especially if the most comparable sales available over the past few months were those of foreclosed properties). In many distressed neighborhoods during the peak of the crisis, there were few comparable sales that did not involve at least one foreclosed property.

Finally, foreclosed homes are often vacant and may be dilapidated. Both vacancy and dilapidation can act as disamenities that deter buyers (Hartley 2011). Especially during times when home buyer demand is already weak, having one or two (or more) vacant, and sometimes boarded-up, properties on a block may

discourage the scarce buyers active in a market from purchasing in that neighborhood. Research has shown that foreclosed homes tend to be in worse condition than owner-occupied properties. In a study of property complaints in the city of Boston from 2008 to 2012, Lambie-Hanson (2013) found that the typical single-family property was more than nine times as likely to receive a complaint from the public while in bank ownership (after foreclosure) as when the previous owner was current on his or her mortgage. Moreover, merely the presence of a vacant home nearby can increase owners' (and potential buyers') uncertainty about the trajectory of home values on the block.

In comments on an earlier version of this chapter, Jim Follain (2014) wisely pointed out a fourth mechanism for the effect on nearby homes that has received less attention in the literature. If higher foreclosure rates in a neighborhood trigger high-risk premiums among mortgage lenders, these higher premiums might lower the price buyers are willing or able to pay for homes in the area. Of course, this mechanism depends on the extent of pricing differentials triggered by perceived risks due to foreclosures. In lending environments in which risk-based pricing is more common, more severe, and more geographically specific, the proximate impacts of foreclosures on nondistressed home values would be expected to be greater.

The disamenity mechanism has been the most widely suggested of the mechanisms outlined here. Foreclosures that lead to vacant properties may become havens for criminal activity, which in turn can depress property values even more. As values decline in a neighborhood, more and more homeowners become underwater, making it difficult or impossible to sell their properties and forcing more homeowners into foreclosure, thus creating a vicious cycle of foreclosures and declines in value. Foreclosures can also spur rapid neighborhood change by forcing out longtime residents and in some cases allowing irresponsible investors or speculators to move in.

Immergluck and Smith (2006a) were the first to measure the impact of foreclosures on nearby property values. Using hedonic regression and data from Chicago in the late 1990s, they found that foreclosures were associated with lower property values of nearby homes, even after controlling for a wide variety of other demographic and property characteristics, including home values in the larger surrounding neighborhood. Each additional foreclosure within an eighth of a mile of a property was associated with a decline in value of 1–1.5 percent. This study was widely cited in efforts to develop policies to respond to the foreclosure crisis and demonstrates the spillover effects of foreclosures on neighbors.

In the wake of the crisis, many researchers expanded on the methods and data of this study to examine foreclosure's effects on nearby property values, especially beginning in the mid-2000s. For example, Hartley (2011) examined foreclosures in Chicago over a longer period, from 1999 to 2008, and found that in high-vacancy census tracts, the effect of a foreclosure on property values within 250 feet was approximately –2 percent, while the effect in low-vacancy tracts was smaller. These findings were roughly consistent with those of Immergluck and Smith (2006a).

In another study, based on data from 1987 to 2008 in the state of Massachusetts, Campbell, Giglio, and Pathak (2011) found that a foreclosure within 0.05 mile lowered the price of a house by approximately 1 percent. Mikelbank (2008) found negative effects of foreclosures on housing values in his analysis of 2006 sales in Columbus, Ohio, but he also found that vacant homes had an even stronger negative effect on prices than nonvacant foreclosures. Harding, Rosenblatt, and Yao (2009) analyzed foreclosures and property sales in seven metropolitan areas from 1989 to 2007 using a repeat sales analysis, which controls for neighborhood conditions. They found that each foreclosure within 300 feet of a property had a –1 percent effect on the property's value and that the effect reached its peak at the time of the foreclosure sale.

In New York City, using data from 2000 to 2005, Schuetz, Been, and Ellen (2008) found that the effect of foreclosures on home prices was nonlinear, meaning that there was little or no effect until a certain threshold number of foreclosures was reached, after which the effect became more sizable. This finding suggests a sort of quadratic relationship between foreclosures and values, where additional foreclosures result in increasingly large (in magnitude) negative spillovers. (It should be noted that there was not really a foreclosure crisis in New York City during this period.)

Some studies, including Daneshvary, Clauretie, and Kader (2011), have found nonlinearities in the other direction, meaning that saturation is reached at some point, after which additional foreclosures appear to have little impact on the magnitude of the (negative) spillover. More particularly, in that study, which looked at data from 2008 and 2009 in Las Vegas, the authors found that the first couple of foreclosures within one-half mile of a property had no impact on its value. After that, the effect increased, up to about 20 foreclosures, after which it stayed relatively flat or even declined slightly. The authors identified a linear rate of increase up to a cumulative effect of about an 8 percent negative spillover (within three months of the foreclosure). After 20 foreclosures, a saturation point was reached.

Other researchers also have identified saturation points. For example, in a study of home sales in the Nashville area from 2001 to 2012, Huang et al. (2014) found steep reductions in values as neighborhood foreclosure rates increased. Such increases reached an inflection point as the foreclosure rate reached 1 percent, at which the cumulative negative spillover effect reached a maximum magnitude of approximately $12,000. It may be that the study by Schuetz, Been, and Ellen (2008) did not detect a saturation point because foreclosures did not reach high levels in the city during the study period, which predated the peak of the foreclosure problem there.

An exhaustive catalog of the dozens of studies measuring the effects of foreclosures on home values is beyond the scope of this chapter. Moreover, any effort to definitively summarize the magnitude of these effects would be extremely difficult because the studies varied widely across a number of parameters, such as those outlined in the following list.

1. The locations and conditions of the housing markets varied greatly. Variations in housing markets would be expected to affect the severity of foreclosure effects on values. Most of the studies, due largely to data availability, focused on just one city or metropolitan area. Some studies attempted to analyze data in several metropolitan areas, but this was further complicated by varying legal definitions of foreclosure from state to state and even sometimes across county or local boundaries.

2. The morphology and density of the cities studied varied greatly. For example, Chicago is four times as dense as Atlanta (with *density* defined as housing units per acre). A buffer of a half mile around a house in Chicago, therefore, would be likely to capture many more adjacent homes, and potential foreclosures, as the same buffer would in Atlanta.

3. Foreclosure can mean many things, and the detectable events involved in the default and foreclosure process depend on state legal prescriptions and how data are reported or collected. In some states, formal foreclosure filings are required at the beginning of the process, while in other states a simple newspaper notice suffices. Some of the studies focused on foreclosure notices or filings, while others examined properties sold at foreclosure auctions or those either entering or already in REO status. Some studies attempted to disentangle the effects of different stages of the foreclosure process, and some even attempted to measure the effects of foreclosure alternatives, especially short sales.

4. The studies used different geographic buffers in calculating the incidence of nearby foreclosure activity. Most of them employed simple circular radial buffers, but some used other techniques, including the face-block concept, which essentially means examining the effects of foreclosures on the same street or across the street, but not on nearby streets.

5. Some studies measured both distance- and time-based decays in effects, and the trigger points for measuring time decays varied.

6. Some studies measured nonlinearities in the cumulative effects of multiple foreclosures, while others did not.

7. The studies used different models, econometric techniques, and sources of data. Among the models used were standard hedonic ordinary least squares, repeat-sales, and panel models. Some of the studies controlled for spatial autocorrelation, and others did not. Data sources varied, including local public records, Multiple Listing Service (MLS) data, and vendor-provided data, which might in turn be based on public records, loan servicing data, or other sources. Although research in mortgage and housing markets increasingly has relied on vendor-provided data, the quality of such data is largely unexplored.

Despite the heterogeneity of the data and methods, the literature as a whole is remarkably consistent in one finding: foreclosures have a statistically significant and economically meaningful negative effect on nearby property values. In his review of an early subset of the literature, Frame (2010) concluded that foreclosures do indeed have a negative impact on nearby property values, with the effect declining over time and space.

The magnitude of all these effects varies widely, as do the metrics used in the studies. Moreover, it is very difficult to tell whether this variation is due to measuring effects—in different cities, at different points in time (e.g., before or after 2007–2008), at different points in the foreclosure process, or using fundamentally different econometric specifications or techniques—or to some other difference among the studies.

A closely related set of studies have focused on the issue of *foreclosure contagion*—that is, do more foreclosures in an area, independent of other housing market forces, lead homeowners in that area or in nearby areas to default and/or enter foreclosure? If foreclosures lead to lower nearby home values, one might expect the answer to be yes, especially since declining home values can make households more vulnerable to foreclosure (if they encounter financial hardships, they will find it more difficult to sell or refinance their homes). While fewer studies have addressed this issue than the price impact issue, those that have done so have generally found evidence of foreclosure contagion.

Munroe and Wilse-Samson (2013) examined Chicago real estate records for 2002–2011 and found that a completed foreclosure, compared with the dismissal of a foreclosure case, raised the probability of a new foreclosure filing within 0.1 mile by 10 percent per year. This amounted to about 0.5 new filings per year. Moreover, they found that this effect lasted three to four years. They also found that contagion led to more completed foreclosures in nearby areas. Li (2013) used MLS data from 2005–2009 for the city of Milwaukee and found that, other things being equal, nearby foreclosure activity positively affected the probability that a homeowner would enter foreclosure. Moreover, Li showed that the magnitude of this contagion declined over time and distance. For example, a foreclosure occurring within the previous three to six months and within 200 meters of a house increased the probability of foreclosure on that house by just over 3 percent. However, a foreclosure farther away—between 500 and 1,000 meters—increased this probability by only 1 percent. If the foreclosure had occurred a year or two before, the effect on the probability of foreclosure was even smaller. Thus, a declining effect over time and space was detected.

Goodstein et al. (2011) analyzed nationwide data from the mortgage data provider Lender Processing Services and found that the likelihood of a mortgage default increased by 0.03 percent in response to a 1 percent increase in the foreclosure rate in zip codes within five miles. This result is not trivial. A one standard deviation increase in the foreclosure rate of the surrounding area would increase the likelihood of mortgage default by as much as 24 percent. The authors controlled for county-level demographic changes and zip-code-level changes in home prices.

FORECLOSURE AND CRIME

Research has found a connection between foreclosure and crime. Homes left vacant for protracted periods can become sites of criminal activity. The earliest study

on the link between foreclosure and crime was done in Chicago in 1999–2001. The study found that higher foreclosure levels in Chicago neighborhoods were associated with higher levels of violent crime, even after controlling for a large number of other neighborhood characteristics (Immergluck and Smith 2006b). A number of other studies have reported consistent results. Stucky, Ottensmann, and Payton (2012) observed that foreclosures in Indianapolis during the middle-to-late 2000s were associated with an increase in neighborhood crime rates (both property crimes and violent crimes). Teasdale, Clark, and Hinkle (2012) found similar results in Akron.

In general, studies using fine-grained data at the neighborhood scale—many with better data sets and more sophisticated methods than the earliest studies—have found that foreclosure leads to increased crime, although some of these findings vary in their details. In a study of New York City between 2004 and 2008, Ellen, Lacoe, and Sharygin (2013) concluded that foreclosures on a particular block led to more total crimes on that block, with the largest increase being in violent crimes. Cui (2010) analyzed crime and foreclosure data in Pittsburgh and found that violent crimes within 250 feet of a foreclosed home increased by more than 15 percent once the home became vacant; similar increases in property crimes occurred. Cui also found that longer versus shorter vacancy periods had larger effects on crime. Williams, Galster, and Verma (2014) used data from Chicago for the years 1998–2009 to disentangle the potential reverse causality between foreclosure and crime. They found that property crime chronologically lags completed foreclosures and not vice versa, adding support to the notion that foreclosure causes crime and is not simply correlated with it for other reasons. Some studies have not attempted to estimate the specific effect of foreclosure on crime but have found an effect of vacancy on crime, and some vacancies are likely associated with foreclosures. Branas, Rubin, and Guo (2012), for example, found that vacant property was among the strongest predictors of assault when tested along with a dozen demographic and socioeconomic variables.

Other studies have attempted to measure the effect of foreclosure on crime at somewhat larger geographic levels, such as counties. However, these studies have often suffered from the fact that crime varies tremendously at very small geographic levels, much of which will not be picked up at the larger geographic scale. Some of them have also faced challenges in developing accurate and unbiased measures of foreclosure rates across different geographies and jurisdictions.[2]

2. An example is Arnio, Baumer, and Wolff (2012), who used counties as the geographic unit of analysis and employed a foreclosure rate in which the denominator was the number of housing units in the county. The denominator is problematic because it can severely overestimate the number of one- to four-unit properties on which there could be a mortgage in counties where there are many multifamily rental housing units. This problem creates a systematic bias in the measure of foreclosure rates across and within different metropolitan areas.

FORECLOSURE AND FISCAL STRESS

Foreclosures and associated vacancies may entail a variety of fiscal costs to local governments. These include the following:

- Increased policing due to vandalism and other crimes.
- An increased burden on the fire department due to arson.
- Costs of boarding up and demolishing buildings.
- Costs of removing trash and mowing lawns.
- Costs of managing the foreclosure process, including record keeping and legal expenses.
- Lost property tax revenue if the building owner stops paying taxes.
- Lost property tax revenue due to declining values of nearby properties.
- Lost economic development benefits due to decreased desirability of the community for commercial/industrial development.

In a study of Chicago before the mortgage crisis of the early 2000s, Apgar and Duda (2005) found that direct costs to city government sometimes exceeded $30,000 per foreclosure. More recent anecdotal evidence supports the high costs of foreclosure and related vacancy. Chicago officials estimated that it cost almost $900,000 to board up and secure just over 600 properties (U.S. Government Accountability Office 2011). Meanwhile, a study of Baltimore estimated that each vacant property increased annual police and fire expenditures by almost $1,500 (Winthrop and Herr 2009).

On the revenue side, the fall in housing prices, often spurred or accelerated by foreclosures, led to a decline in property tax revenues in many cities during the late 2000s. Chernick, Langley, and Reschovsky (2011) concluded that in cities hit hard by the foreclosure crisis, lower property values would lead to major declines in property tax revenues. In Las Vegas, for example, they estimated a 22 percent drop in revenues, while in Modesto and Stockton, California, their estimates were in the range of 24–25 percent.

Conclusions

The research detailed in this chapter focused on the relatively near-term impacts of foreclosure on households and neighborhoods. The literature generally shows that foreclosure resulted in negative, nontrivial effects on household financial conditions, health, and schooling, among other important variables. The research on foreclosure contagion and the effects of foreclosure on nearby property values was unequivocal in that almost all the studies found nontrivial negative impacts resulting from foreclosure. The robustness of the methods and the geographic diversity of the studies suggest that these effects were usually economically substantial. However, the heterogeneity in the data, methods, and geographic locations employed makes it very difficult to develop any sort of statistics that would accurately capture any central tendency of the magnitude of these effects. In terms

of the effects of foreclosure on crime, the stronger studies that used sound measures of foreclosure activity at small geographic levels tended to find material impacts of foreclosure on crime, or in some cases regression-adjusted associations. However, this research was not quite as large or robust as the property value literature.

This chapter did not explore research that has examined the longer-term effects or trajectories of foreclosure, including the purchase of properties by investors, the conversion of properties from owner-occupied to rental uses, or the redevelopment of properties using subsidies such as the federal Neighborhood Stabilization Program. Examples of this research include Immergluck and Law (2013) and Pfeiffer and Molina (2013). Another related area of inquiry that has received little attention is the longer-term impacts of the foreclosure crisis on housing tenure in areas where investors may have converted many owner-occupied homes to rental properties. To the extent that some neighborhoods may have seen rapid declines in owner occupancy rates, especially in areas that had relatively high home ownership rates before the crisis, the effects of the crisis could be significant. Moreover, the receptiveness of such neighborhoods to the conversion of owner-occupied single-family homes to rental properties—including the potential fair housing implications—deserves more scrutiny.

In terms of policy implications, some lessons are generally clear. Foreclosure imposes sizable negative costs on individuals, families, and neighborhoods. Many of these costs affect those not involved in the mortgage transaction. When attempting to reform mortgage markets and adopt new regulations, policy makers must consider the damage done by reckless or overly aggressive mortgage lending practices. Many of the policy initiatives thus far have been federally regulated and focused on protecting consumers. These are worthy efforts, but the spatial implications of concentrated risky lending and the associated foreclosures suggest that local and state governments have a stake in this reform effort, too. Fortunately, the Dodd-Frank Act of 2010, by limiting the preemption of state mortgage regulations, allows states to retain the ability to regulate markets if they view federal efforts as insufficient. Given the costs to localities and neighborhoods reported here, this is appropriate.

In addition, federal efforts to reform mortgage markets that relied too heavily on privatization may result in new boom-bust markets and more risk-based pricing—possibly at the neighborhood level. Replacing the cross-subsidization that occurred in the traditional government-sponsored secondary markets with much higher levels of risk-based pricing and a resurgence of high-risk lenders may amplify the tendency toward neighborhood-level housing market volatility and exacerbate the spillover effects of default and foreclosure. Under such a system, as foreclosures increased and values fell, lenders would be likely to charge substantially higher rates in the most heavily impacted neighborhoods, fostering another downward spiral. A more uniform and less segmented mortgage market, with less severe risk-based pricing, should dampen the effects of mortgage distress in neighborhoods experiencing foreclosures, mitigating against vicious cycles. In

addition to encouraging cross-subsidization and broader, less specialized secondary markets, federal (and state) agencies should aggressively enforce the Fair Housing Act to minimize excessive mortgage pricing disparities, which could exacerbate spatial contagion of housing market problems and negative spillovers into the mortgage and housing markets.

State and local governments also have a role to play. They need the tools to intervene in property markets at the earliest signs of mortgage and housing distress, both to stem the tide of foreclosures and to mitigate against the blight and vacancy that can accompany them. These tools might include the ability to assemble and redevelop or demolish distressed properties that harm nearby homes and entire neighborhoods.[3] It is much more difficult to address these sorts of problems after they have reached crisis proportions, as they did in many neighborhoods in 2008 and 2009.

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COMMENTARY

James R. Follain

There is massive literature on the housing crisis that triggered the Great Recession of 2007–2009 and that has persisted for many years since the official end of the Great Recession. Dan Immergluck does an excellent job of summarizing this research. He shows that the crisis generated unprecedented increases in the number of mortgage foreclosures and that foreclosures were especially prevalent among homeowners who had subprime mortgage loans, which were disproportionately concentrated among minority households and neighborhoods with substantial minority populations. Immergluck examines the negative impacts of foreclosures on the value of nearby properties and the households experiencing foreclosure. He does a particularly nice job of covering literature from a wide variety of interdisciplinary journals and publications.

This commentary draws on a number of studies about the crisis that support Immergluck's conclusions. Most of these studies focus on the drivers of housing prices at the metropolitan statistical area (MSA), county, zip code, and property levels.

One theme that is consistent in those studies, as well as the ones described by Immergluck, is that the impacts of the housing crisis varied widely among states and metropolitan areas, as well as within metros. One example of a study that reflects this is Follain (2012a), which discusses a number of different phases or measures of distressed real estate and how they varied among zip codes within the same counties in New York, Connecticut, and New Jersey. These measures included the number of properties with negative equity (stage 1), the number in which the foreclosure process had begun (stage 2), and the number on which foreclosure had occurred and the properties were in the lenders' real estate owned (REO) inventory (stage 3). The analysis demonstrated wide variations in these measures among states, counties, and zip codes within counties. It also suggested that the potential for future foreclosures and the problems associated with lingering supplies of REO properties still existed in 2012. One figure in Follain (2012b), which is also discussed in Follain and Giertz (2013, fig. 7), captures the variations in shares of properties with negative equity within Nassau County, New York. Many zip codes in that county had shares of less than 10 percent, while many others had shares in excess of 40 percent. Clearly, the threat of future foreclosures in these areas was still present several years after the bust began.

Another example is Follain (2012b), which examines variations in housing price growth at the county level between 2005 and 2011. This study allowed for the incorporation of many more variables, which is possible with longer time series studies of housing prices. Two conclusions of this research are consistent with Immergluck's. One is that counties with larger volumes of high-cost or subprime mortgages in 2004–2005 experienced much larger declines in housing prices than those with smaller volumes of subprime lending. Another is that growth in

housing prices was slower in counties with relatively larger inventories of foreclosed properties awaiting sale back to the private market.

This study, as well as those by Follain and Giertz (2011, 2012) and a policy focus report (Follain and Giertz 2013), highlights two another aspects of the crisis: the difficulty of predicting the demise of the housing price bubble and the negative consequences of the potential bust. In all of these studies, a residual term measuring the gap between actual level of housing prices at a particular point in time (e.g., 2007:q1) and the level deemed to be more consistent with certain levels of the fundamental drivers of housing prices was negatively related to the future growth in prices. In addition, growth in housing prices between 2005 and 2011 was much smaller in counties with relatively large growth rates in housing prices in 2004–2005. That is, in 2004–2005 a bubble was emerging at different rates in different areas of the country, and the subsequent bust had widely varying impacts across those areas. These differences surely fueled some of the growth in the demand for subprime lending, but this connection between the growth in subprime lending and the housing price bubble seems to me to be a somewhat separate phenomenon associated with the crisis not addressed by Immergluck in his chapter. That is, why did so many households and policy makers simply overestimate future price growth and underestimate the severe and widely varying downturns in housing prices that were to come in many parts of the country?

The meta-question that is discussed by many but receives relatively little attention in Immergluck's chapter is, what can we do to avoid future bubbles and busts and the enormous negative fallout they create? Immergluck does offer two suggestions that are consistent with my thinking. First, he writes, "The heterogeneity in the data, methods, and geographic locations employed makes it very difficult to develop any sort of statistics that would accurately capture any central tendency of the magnitude of these effects." Second, he notes, "Many of the policy initiatives thus far have been federally regulated and focused on protecting consumers. These are worthy efforts, but the spatial implications of concentrated risky lending and the associated foreclosures suggest that local and state governments have a stake in this reform, too." This is consistent with one of the two main policy implications discussed in Follain and Giertz (2013): neither policy makers nor researchers at the time had sufficient information about the problems to create and apply a one-size-fits-all solution to the foreclosure crisis. They suggest that more experimentation on the hardest-hit areas should have taken place, in order to gain the information needed to design, for example, a more effective Home Affordable Modification Program (HAMP).

Follain and Giertz (2013) also discuss an issue not addressed by Immergluck: the role of monetary policy. In their view, monetary policy is too blunt an instrument to deal with the wide variations in housing markets, and a broader range of macroprudential policies is needed. For example, such policies might include buffers that increase capital and the cost of lending during the onset of a bubble in order to reduce the chances of a bust. Follain and Giertz's recommendation is that such policies should vary widely among local housing markets. This may

be very hard to implement, but my guess is that Immergluck would support this principle and acknowledge both the technical and political challenges associated with such policies.

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8

A Realistic Assessment of Housing Finance Reform

Laurie S. Goodman

It has been nearly six years since Fannie Mae and Freddie Mac went into conservatorship, a status from which the two entities were never expected to emerge. At that time (September 2008), legislators intended to replace the public-private partnership that characterized the government-sponsored enterprises (GSEs) with a new housing finance system, which placed private capital in the first-loss position.[1]

However, that task has proved to be very difficult, and it has been made more difficult by a deeply divided Congress. While in mid-2015 members of Congress generally agreed on the principles of a new system, they had yet to reach a consensus on the design of the system, leaving a legislative solution in the near term unlikely. Thus, the most important action on reform will take place within the

1. When the GSEs were placed into conservatorship, U.S. treasury secretary Henry Paulson stated: "Because the GSEs are Congressionally-chartered, only Congress can address the inherent conflict of attempting to serve both shareholders and a public mission. The new Congress and the next Administration must decide what role government in general, and these entities in particular, should play in the housing market. There is a consensus today that these enterprises pose a systemic risk and they cannot continue in their current form. Government support needs to be either explicit or non-existent, and structured to resolve the conflict between public and private purposes. And policymakers must address the issue of systemic risk. I recognize that there are strong differences of opinion over the role of government in supporting housing, but under any course policymakers choose, there are ways to structure these entities in order to address market stability in the transition and limit systemic risk and conflict of purposes for the long-term. We will make a grave error if we don't use this time out to permanently address the structural issues presented by the GSEs" (U.S. Department of the Treasury 2008).

Federal Housing Finance Agency (FHFA), the regulator of the GSEs, and, to a lesser degree, the Obama administration.

The first section of this chapter looks at the history and current status of the GSEs. The second section discusses the possible paths the legislation could have taken, the implications of each for mortgage rates and credit availability, and the slowly forming consensus view. The final section describes the administrative actions the FHFA has taken, as well as further actions the agency and the U.S. Department of the Treasury could take.

The History and Current Status of the GSEs

THE FIRST SIX DECADES

Before the Great Depression, mortgage finance in the United States was dominated by private entities. Mortgages were short-maturity instruments (10 years or less) with balloon payments at the end. The assumption was that borrowers would roll over the loans when they matured. The absence of a national housing finance market led to considerable geographic variation in the availability and pricing of credit, and high down payment requirements depressed widespread home ownership.[2]

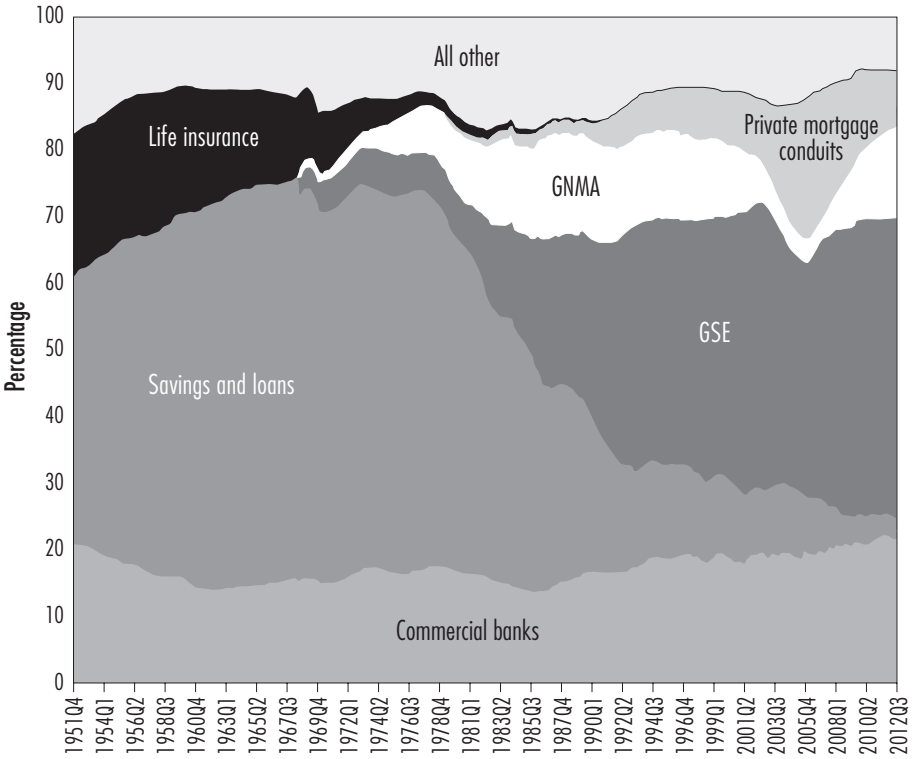
During the Great Depression, which generated widespread foreclosures (20–25 percent of the mortgage debt was in default) and falling home ownership rates, the government created the Federal Home Loan Bank (FHLBank) system in 1932. This organization was intended to provide member institutions with financial products and services, including on-demand low-cost funding to assist and enhance lending for home mortgages and small business, rural, agricultural, and economic development. The Federal Housing Administration (FHA) was created in 1934 to offer federally backed insurance for home mortgages made by FHA-approved lenders.

Originally a federal government agency, the Federal National Mortgage Association (Fannie Mae) was created in 1938 as a secondary market entity to purchase, hold, and sell FHA-insured loans. Fannie Mae was designed to provide liquidity to the mortgage market by buying loans from lenders and allowing them to make new loans with the cash. In 1954, Fannie was transformed into a public-private mixed-ownership corporation exempt from all state and local taxes (except those on real property). In 1968, it was turned into a for-profit shareholder-owned company and removed from the federal budget. In 1970, Fannie was permitted to buy and sell mortgages not insured by the federal government.

The Federal Home Loan Mortgage Corporation (FHLMC, or Freddie Mac) was established in 1970—capitalized and owned by the FHLBanks—to purchase long-term mortgages from thrift institutions, thereby providing the thrifts with

2. For more details on the early history of the GSEs, see FHFA OIG (n.d.) and DiVenti (2009).

Figure 8.1
The Distribution of Outstanding Single-Family Mortgages, 1951–2012 (%)



Note: GNMA = Government National Mortgage Association; GSE = government-sponsored enterprise.
Sources: Data from Federal Reserve Flow of Funds (various issues), compiled by Urban Institute.

liquidity. The thrifts could use the proceeds from the sales to make more mortgages. The GSEs began to grow rapidly during this period, as shown in figure 8.1. The GSE share of outstanding mortgages increased from 0 percent in early 1968 to 7.2 percent in 1980 and 27.4 percent in 1990.

In the 1970s and 1980s, Fannie Mae and Freddie Mac pursued different paths. On one hand, Fannie primarily retained mortgages on its own balance sheet, leaving its portfolio with a considerable amount of interest-rate risk. On the other hand, Freddie had a small balance sheet and transferred most of the interest-rate risk of the mortgages it held through securitizations, doing the first securitization in 1971. (By contrast, Fannie did not do its first securitization until a decade later.) Thus, the market turbulence in the late 1970s and early 1980s

left Fannie, but not Freddie, exposed, with the former requiring government assistance through regulatory forbearance (capital requirements were relaxed) and tax relief.

In 1989, the FHLBank system was restructured. The FHLBank board was abolished, the Federal Housing Finance Board was created as a regulator, and membership in the FHLBanks was opened to depository institutions that had more than 10 percent of their portfolios in residential mortgage–related assets. Freddie Mac was reorganized into a corporate structure similar to that of Fannie Mae, a for-profit corporation owned by private shareholders rather than the FHLBanks.

In 1992, Congress passed the Federal Housing Enterprises Financial Safety and Soundness Act, which created the Office of Federal Housing Enterprise Oversight (OFHEO) within the Department of Housing and Urban Development (HUD) as an independent regulator of the GSEs. This act also gave the GSEs an "affirmative obligation to facilitate the financing of affordable housing for low- and moderate-income families."[3] Beginning in 1995, Fannie and Freddie were given explicit housing goals.

THE GSES AS BUSINESSES, 1990–2008

The GSEs' share of the outstanding mortgage market continued to increase rapidly, from 27.4 percent at the end of 1990, to 39.7 percent at the end of 2000, and then to 43.8 percent at the end of 2003. At the end of 2013, their share stood at 45.7 percent (see figure 8.1).

Fannie and Freddie were really in three businesses: (1) a large single-family insurance business; (2) a relatively small multifamily insurance business; and (3) the portfolio management business (the management of their retained portfolios). This third business was a key, if then underappreciated, contributor to their profitability. During the 1990s, the GSEs began to grow their retained portfolios very rapidly, even more rapidly than their insurance operations. Jaffe (2005, 4) points out that "in 1990 the Fannie and Freddie retained portfolios equaled 23 percent of their outstanding MBS [mortgage-backed securities], while by 2001, this ratio reached 80 percent." In absolute terms, their mortgage-related retained portfolios grew from $138 billion in 1990 to $1,570 billion in 2004. This portfolio growth fueled the organizations' profitability.

> The profit potential for the two F&F business lines is substantially different. Revenue on the F&F investor-held MBS line derives primarily from the annual fee received for guaranteeing the timely payment of interest and principal. The average guarantee fee for . . . 2003 was just over 20 ba-

3. Housing and Community Development Act of 1992, Section 1302(7). Also see U.S.C. Title 12, Ch. 46, Section 4501.

> sis points (bps) for the two firms. Revenue for the retained mortgage portfolios, in contrast, is based on the spread between the interest rate earned on the mortgage assets and the interest cost of the funding liabilities. For example, in 2003, the average spread was 172 bps for Fannie Mae and 186 bps for Freddie Mac. The relatively large size of this rate spread arises from the low interest cost of F&F debt (due to the implicit Treasury guarantee) and the compensation for accepting the interest-rate risk associated with the mortgage securities held in the portfolios. (Jaffe 2005, 123)

THE SEEDS OF THE GSES' DIFFICULTIES

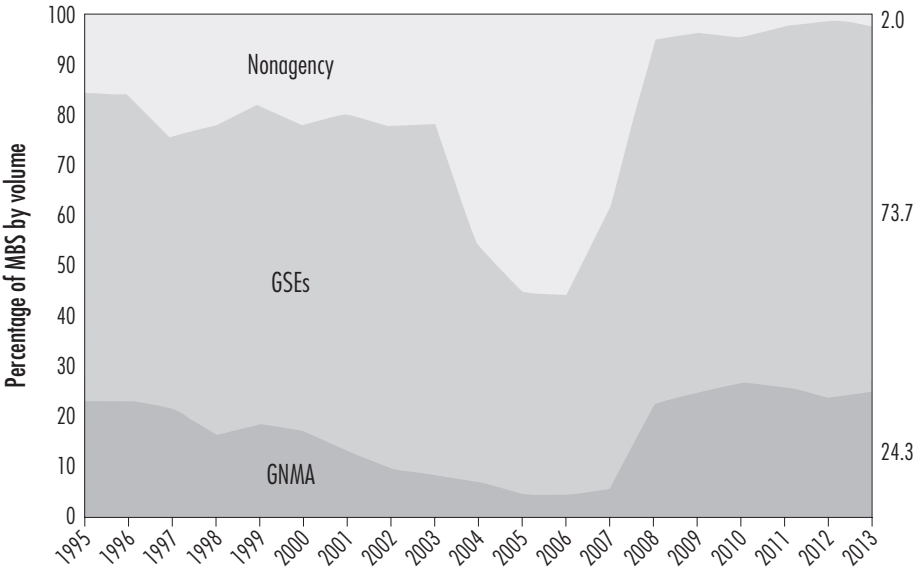
Both Fannie Mae and Freddie Mac had accounting difficulties in the early 2000s. In 2003, Freddie disclosed that it had used improper accounting practices. The new GSE supervisory authority, OFHEO, found that this error had resulted in a $5 billion misstatement for the years 2000–2003; Freddie was fined $175 million. OFHEO also investigated Fannie and found that it had used improper accounting to smooth earnings; Fannie paid a $400 million penalty. These episodes undermined the credibility of the GSEs.

It is important to realize that Fannie and Freddie have played a critical role in the housing finance market. They have reduced mortgage rates for borrowers by bringing transparency and standardization to the market. They were crucial to the securitization of conventional mortgages, which led to the development of the national mortgage market. And they made purposeful efforts to expand access to credit. Although Fannie and Freddie had affordable housing goals, as detailed in HUD (2009), the amount of their activity to underserved borrowers and markets often exceeded the requirements (Bolotnyy 2012; Weicher 2010).

The government share of total securitizations ranged between 75 and 85 percent from 1995 to 2004, with the GSEs accounting for the bulk of this activity. It dropped to 54 percent in 2004 and 44–45 percent in 2005 and 2006 (figure 8.2). The GSEs, alarmed at their slipping share, began to follow the private-label securities (PLS) market into nontraditional products. Despite claims to the contrary, their expansion into these products was aimed at correcting a declining market share, not meeting affordable housing goals. The GSEs relaxed their standards for origination, agreeing to provide insurance for more Alt-A loans, interest-only (IO) loans, adjustable rate mortgages, and borrowers with very low FICO scores. The Fannie Mae numbers are shown in table 8.1 (Freddie's numbers were similar). The share of Alt-A loans was 9.9 percent for 2004 and earlier production. It increased to 20.9 percent for 2005, 29.8 percent for 2006, and 20.0 percent for 2007, and then largely disappeared. Interest-only loans increased from 2.8 percent for 2004 and earlier production to 13.1 percent for 2005, 20.0 percent for 2006, and 18.1 percent for 2007, before declining sharply. Adjustable rate mortgages and loans to borrowers with FICO scores less than 620 exhibited a similar pattern.

Unfortunately for the GSEs, they jumped into the nontraditional lending market at the worst possible time. The PLS market was going after increasingly

Figure 8.2
Agency and Nonagency Shares of Residential Mortgage-Backed Securities (MBS) Issued, 1995–2013



Note: GSEs = government-sponsored enterprises; GNMA = Government National Mortgage Association; the agency share is the sum of the GSE and GNMA share.
Sources: Data from Inside Mortgage Finance and Urban Institute; Urban Institute Chartbook (May 2014).

Table 8.1
Risk Characteristics of Fannie Mae's Book of Business, 2004–2013

Vintage	Unpaid Principal Balance (billions of dollars)	FICO Score <620	Interest-Only Loans	Adjustable Rate Mortgages	Alt-A Loans
2004 and earlier	256.7	7.2%	2.8%	17.5%	9.9%
2005	99.6	6.5	13.1	29.7	20.9
2006	98.7	8.6	20.0	33.5	29.8
2007	137.2	10.8	18.1	32.3	20.0
2008	80.3	5.4	7.5	22.2	3.2
2009	209.0	0.7	1.0	2.8	0.5
2010	280.2	0.7	1.0	4.6	1.0
2011	320.8	0.7	0.6	5.5	1.8
2012	728.0	1.0	0.3	2.6	1.1
2013	609.9	1.5	0.2	2.4	1.3
Overall book	2,820.4	2.6	2.9	8.5	4.7

Source: Fannie Mae (2013).

risky loans to feed its voracious appetite for product. Anxious to maintain their market share, the GSEs relaxed their standards and chased the PLS market into what turned out to be treacherous terrain.

Yet the GSEs' difficulties did not stem solely from the move to nontraditional products. In the early 2000s, subprime MBS were the most profitable items to add to their retained portfolios. Adelino, Frame, and Gerardi (2014) note that Freddie and Fannie together purchased 3.8 percent of subprime issuance in 2001, 11.9 percent in 2002, 34.7 percent in 2003, 38.9 percent in 2004, and 28.9 percent in 2005, before tapering off to 23–25 percent in 2006 and 2007. In 2004, when Freddie and Fannie started reporting their public holdings, nonagency MBS made up 35 percent of Freddie's retained portfolio and 15 percent of Fannie's; that share remained constant through the end of 2006. These MBS were often backed by loans that the GSEs would not insure. However, they (like most other investors participating in the market at that time) believed that the product they were purchasing had adequate subordination, so they were not taking much risk. That is, the GSE purchased the most senior classes of the securitization, the subordinate securities were in a first-loss position, and the subordination amounts were much larger than the GSE's estimates of possible losses.

STALLING HOME PRICES AND THE GSES

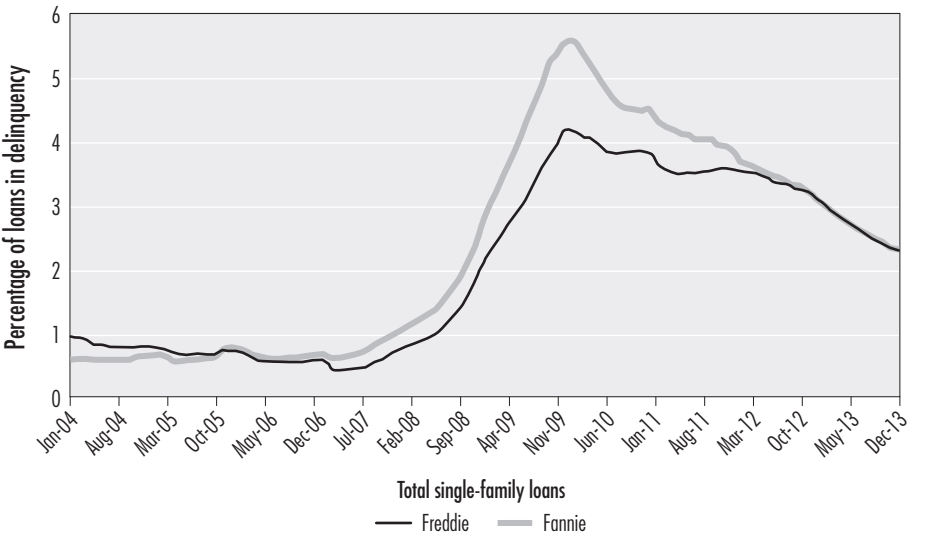
When home prices topped out and began to stall, the GSEs were vulnerable in two of their three businesses: their retained portfolio and single-family insurance operations. Their multifamily operations also experienced losses, but these losses were small, and the operations recovered quickly.

The problems were first evident on the portfolio side of the GSEs' business, as markets react in real time. Prices on the MBS began to fall substantially. Though not a perfect proxy for the subprime deals the GSEs had purchased, the ABX, an index of credit default swaps, is illustrative. The price of the ABX 06-2, tranches of AAA deals issued in the second half of 2006, plummeted from $100 in late 2006 to around $40 in late 2008 and $20 by March 2009.

By late 2007, the percentage of serious delinquencies in the Fannie and Freddie single-family guarantee businesses had begun to rise sharply, as shown in figure 8.3; this increase accelerated further in 2008. The increase in serious delinquencies reflected not only extremely poor performance on the part of the nontraditional products but also much higher than anticipated numbers of delinquencies and defaults on Fannie's and Freddie's traditional products.

The very high numbers of delinquencies and defaults on the nontraditional products, especially Alt-A loans, contributed disproportionately to the GSEs' losses. For example, Fannie reported that Alt-A loans were 4.7 percent of its total single-family guarantee business at the end of 2013 but that they had contributed 23.7 percent of its credit losses in 2012 and 26 percent in 2013. Interest-only loans were 2.9 percent of Fannie's total single-family guarantee business at the end of 2013 but had contributed 21.8 percent of its credit losses in 2012 and 18.7 percent in 2013.

Figure 8.3
GSE Loans in Serious Delinquency, 2004–2013



Notes: Data include only 30-year, fixed-rate, full-documentation amortizing loans. Default data were balance-weighted. "Serious delinquency" means loans were 90 days or more delinquent or in foreclosure.
Sources: Data from Fannie Mae (various years); Freddie Mac (various years).

The effect of the downturn in home prices on delinquencies and defaults on the GSEs' traditional books of business can best be seen by looking at data on Freddie's 30-year, fixed-rate, full-documentation amortizing products. These data do not include any of the nontraditional products (Alt-A, IO, or 40-year loans), nor do they include loans purchased under any of Freddie's affordability programs. See Freddie's 2001 and 2007 books of business in table 8.2. The left half of the table shows that for 30-year, fixed-rate, full-documentation amortizing product the composition (percent in each loan-to-value [LTV] and FICO score combinations) was very similar in 2001 and 2007. The right half shows that for every FICO-LTV combination, the default rate (loans six months delinquent or removed earlier than that because of a short sale, foreclosure sale, REO sale, or deed-in-lieu) was considerably higher for the 2007 book of business than for the 2001 book. For example, borrowers with a FICO score of 701–750 and an LTV of 70–80 had a 0.5 percent default rate for 2001 and an 11.1 percent default rate for 2007. The point: The credit performance of loans is determined not only by origination characteristics but also by the macroeconomic environment, particularly home prices. That is, the mix of origination characteristics is roughly the

Table 8.2
Freddie Mac Composition and Default Rates of Loans Originated in 2001, 2007, and 2012

Year of Origination	FICO Score/Loan-to-Value	Composition (% of balances)						Default Rate (% of balances)					
		≤60	60–70	70–80	80–90	>90	All	≤60	60–70	70–80	80–90	>90	All
2001	≤700	3.4	3.8	17.4	6.6	6.5	37.7	0.9	1.3	2.0	4.2	4.7	2.6
	701–750	4.0	3.7	15.5	3.9	3.5	30.6	0.2	0.3	0.5	1.2	1.5	0.6
	>750	7.3	4.9	14.9	2.6	2.1	31.7	0.1	0.1	0.2	0.6	0.7	0.2
	All	14.7	12.3	47.8	13.1	12.1	100.0	0.3	0.5	1.0	2.6	3.1	1.2
2007	≤700	5.2	4.9	15.6	5.1	5.5	36.3	9.2	16.8	17.8	22.2	24.1	18.1
	701–750	4.0	3.1	13.5	2.8	2.9	26.3	3.8	9.2	11.1	14.6	14.9	10.5
	>750	9.2	4.8	17.9	2.7	2.7	37.4	1.2	3.7	5.2	8.4	9.6	4.6
	All	18.5	12.8	47.0	10.7	11.0	100.0	3.8	9.7	10.9	16.7	18.1	10.9
2012	≤700	2.5	1.7	4.5	0.4	0.4	9.3	0.0	0.0	0.0	0.0	0.0	0.0
	701–750	4.6	3.3	12.8	1.7	1.3	23.8	0.0	0.0	0.0	0.0	0.0	0.0
	>750	17.5	10.1	33.2	3.8	2.2	66.9	0.0	0.0	0.0	0.0	0.0	0.0
	All	24.6	15.1	50.5	5.9	3.9	100.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: Data include only 30-year, fixed-rate, full-documentation amortizing loans. Composition and default data were balance-weighted.
Source: Urban Institute calculations based on data from Freddie Mac public loan-level credit database.

same in 2001 and 2007, but the credit performance is very different. The strength of the interaction between home prices and performance was underestimated, as was the magnitude of the feedback effects, as home prices continued to crash.

FLAWS IN FANNIE AND FREDDIE'S STRUCTURE

A number of structural flaws left the GSEs unable to sustain this increasing pressure. The Treasury Department and HUD did an excellent job of outlining those flaws in their February 2011 report to Congress (U.S. Department of the Treasury and HUD 2011, 8–9); we paraphrase and summarize this section, expanding on several points.

Fannie Mae and Freddie Mac's Profit-Maximizing Structure Undermined Their Mission The charters of the organizations required Fannie and Freddie to promote market stability and access to mortgage credit. "However, their private shareholder structure . . . encouraged management to take on excessive risk in order to retain market share and maximize profits, and leaving taxpayers to bear major losses" (U.S. Department of the Treasury and HUD 2011, 8). This led to the commonly heard refrain that the profits were privatized, while the losses were socialized.

Fannie Mae and Freddie Mac's Implicit Government Backing Conferred Unfair Advantages The entities benefited from preferential tax treatment and, more important, far lower funding costs than other regulated financial institutions because of the perceived government guarantee (the commonly held assumption that big losses would be borne by the taxpayers). This encouraged Fannie and Freddie to build large investment portfolios, carrying these securities at far wider margins than their competitors, and to take risks through the guarantee business that ultimately caused their failure.

Fannie Mae and Freddie Mac's Capital Standards Were Inadequate "Fannie Mae and Freddie Mac were required to hold less capital than other regulated private financial institutions" (U.S. Department of the Treasury and HUD 2011, 8): only 40 bps of capital for every $100 they insured. As a result, they could set their guarantee fees (G-fees) lower than those of comparable institutions. The lower amount of required capital also left the entities with an insufficient cushion to absorb losses. On the retained portfolio side, Fannie and Freddie were required to hold 2.5 percent capital, permitting them to leverage 40 to 1.

Fannie Mae and Freddie Mac's Regulator Was Structurally Weak and Ineffective OFHEO "did not have adequate enforcement mechanisms or authority to set capital standards to constrain risky behaviors" (U.S. Department of the Treasury and HUD 2011, 9). Nor were its stress tests meaningful. "Over the years, Fannie and Freddie's aggressive lobbying efforts had successfully defeated efforts to bring them under closer supervision" (9).

The Housing and Economic Recovery Act of 2008 (HERA) created a new regulator, the FHFA, to replace OFHEO. To be fair, OFHEO was not the sole regulator that failed to restrain risky behavior. The entire regulatory system failed to take action against the use of nontraditional products and notice the excessive amount of leverage in the system, which set the stage for the crisis.

Moreover, the consequences of the flaws inherent in the GSE structure were amplified because of the interactions among the elements. The incentives that encouraged the portfolios to add subprime securities and those that encouraged the GSEs to move into nontraditional products to maintain market share were magnified by inadequate capital standards.

THE BEGINNING OF CONSERVATORSHIP

By September 2008, the country was in the midst of a financial crisis, with many institutions teetering on the brink and Fannie and Freddie racking up large losses. On September 7, the FHFA placed the GSEs under conservatorship, and the Treasury Department entered into a Senior Preferred Stock Purchase Agreement with each GSE. Under the terms of the initial agreement, the Treasury would disburse funds to the GSEs if, at the end of any quarter, the FHFA determined that the liabilities of either exceeded its assets. The maximum amount available to each GSE was $100 billion; this figure was raised to $200 billion in May 2009. In exchange for this financial support, the Treasury received from each of Fannie Mae and Freddie Mac one million shares of nonvoting variable liquidation preference senior preferred stock with a liquidation preference value of $1,000 per share, along with a nontransferable warrant with an expiration in 20 years, for the purchase of 79.9 percent of common stock at a nominal cost. This senior preferred stock would accrue dividends at 10 percent a year, payable quarterly. (The rate would increase to 12 percent if the dividends were not paid in cash.)

The preferred stock purchase agreements (PSPAs) were written in that form to avoid placing the assets and liabilities of the GSEs in the federal budget. If the U.S. government were to own more than 80 percent of either enterprise, there would be a sizable risk that the enterprises would be forced to consolidate onto the government's balance sheet.

These first PSPAs required Freddie and Fannie to wind down their investment portfolios at 10 percent a year until each reached $250 billion. No restrictions were placed on either their single-family or multifamily guarantee books of business.

In December 2009, the Treasury amended the PSPAs to replace the $200 billion cap with a formulaic cap for 2010–2012. The cap would adjust upward by the cumulative amount of any losses realized by the GSEs and downward by any gains (but not below $200 billion per GSE); it would become fixed at the end of the three years. In plain English, this amendment essentially exempted losses incurred during 2010–2012 from the $200 billion cap.

It is interesting that the PSPAs did not contain any mechanism for Fannie and Freddie, if and when they became profitable, to pay back their debt to the

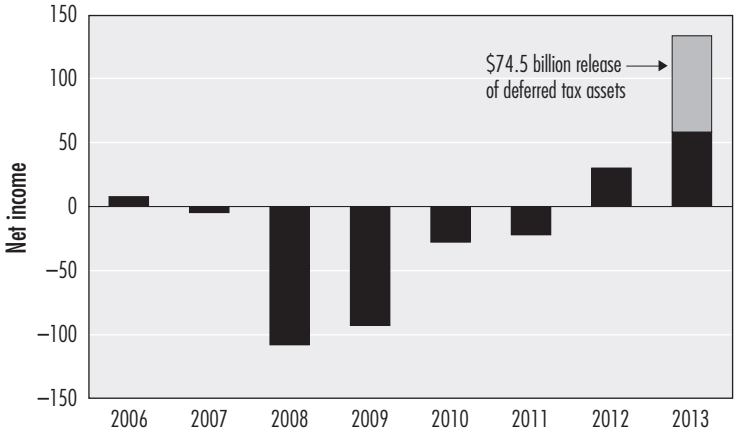
government. In fact, even if the GSEs were able to pay back the debt, they would not be permitted to do so under the terms of the PSPAs. This provides some indication of the thought process at the time: the GSEs were never provided with a mechanism to emerge from conservatorship because it was never expected they would do so. One might be able to argue that the Treasury was moving so quickly in 2008 that this possibility was overlooked, but it seems unlikely that it would have been overlooked in 2009 as well.

The PSPAs were amended for a third time on August 17, 2012. According to the news release, "This will help achieve several important objectives, including . . . acting upon the commitment made in the Administration's 2011 White Paper that the GSEs will be wound down and will not be allowed to retain profits, rebuild capital, and return to the market in their prior form" (U.S. Department of the Treasury 2012). Another objective was to provide greater market certainty regarding the financial strength of the GSEs. According to an FHFA statement at the time, "As Fannie Mae and Freddie Mac shrink, the continued payment of a fixed dividend could have called into question the adequacy of the financial commitment contained in the PSPAs" (FHFA 2012b). That is, some were concerned that Fannie and Freddie would have to continue to borrow from the Treasury to pay their 10 percent dividends. Once the credit lines were fixed in late 2012, the draws from the Treasury would begin to eat into that line. The fixing of the credit lines was necessary because the Treasury's Troubled Asset Relief Program authority was about to expire. By making the dividend variable with profits, the Treasury ensured that Fannie and Freddie would not have to draw any money from the Treasury unless they actually lost money.

This PSPA amendment contained three changes. The first and most dramatic was a full sweep of all Fannie Mae and Freddie Mac earnings, replacing the 10 percent dividend required by the first two PSPAs. The second change was that the portfolios were to be wound down at an annual rate of 15 percent, as opposed to the 10 percent required in the earlier agreements, until each portfolio reached its target of $250 billion. Finally, each GSE would be required to submit to the Treasury a plan to reduce taxpayer exposure to mortgage credit risk in both its guarantee book of business and its retained portfolio.

These changes, which took effect just as the housing market started to improve, proved to be very controversial. A number of hedge funds began to purchase Fannie's common and preferred stock as the outlook for housing improved, believing the GSEs would again become profitable. Meanwhile, Fannie took its last draw from the Treasury in the fourth quarter of 2011; Freddie drew a small amount in the first quarter of 2012. Both GSEs were solidly profitable in the second quarter of 2012; it is unclear whether the strength of these financial results was known when the sweep decision was made in August 2012. Moreover, many at that time questioned whether the housing recovery could be sustained. Market expectations were changing rapidly, and analysts went from expecting a run of bad quarters that would continue indefinitely to playing out the implications of the GSEs being profitable.

Figure 8.4
The GSEs' Net Income, 2006–2013 (billions of dollars)



Sources: Data from FHFA (2013a) and FHFA (2013c).

As a result, several shareholder lawsuits dispute the Treasury's assertion that the amendment was meant to provide the market with reassurance of the GSEs' financial stability. These investors argue that there was little to indicate the market needed reassurance, that the change was made just as Fannie and Freddie began to turn a profit, and that the profits were apt to continue in the improving housing market.

By the middle of 2014, Fannie and Freddie had returned to profitability and paid back more than they had borrowed from the government. Figure 8.4 shows Fannie and Freddie's net income since 2006 as calculated by the FHFA. The agency's first-quarter 2013 conservator's report states that as of the end of 2007, the GSEs had $71 billion of capital (FHFA 2013a). Their charges against capital totaled $266 billion for 2008–2011 (slightly more than their net income), requiring them to draw $187.5 billion from the Treasury during this period. Out of that amount, dividends accounted for $36 billion (Wall 2014), making the actual amount borrowed $151.5 billion. That amount was more than paid back by profits in 2012 and 2013, plus the $9.3 billion net income generated in the first quarter of 2014.

While most of the 2012–2014 profitability was generated by extraordinary items such as the release of the deferred tax asset (which accounted for $74.5 billion of the 2013 earnings), the release of loan loss reserves, and gains from legal settlements, the two GSEs were unquestionably profitable. Based on the size of their retained portfolios in 2014, on a steady-state basis they should generate about $31 billion in net income annually going forward, a figure that will decline

to about $25 billion as they reduce their retained portfolios. This calculation assumes that they will generate 35 bps of net income on new production (after all expenses and losses and payment of the payroll tax surcharge) on a $4.2 trillion single-family guarantee business, or $14.7 billion of net income (35 bps × $4.2 trillion).[4] Add to that portfolio profits of $13.5 billion (assuming 150 bps on the joint $900 billion portfolio), which should decline rapidly to $7.5 billion on future portfolio holdings of $500 billion ($250 billion apiece), and multifamily profits of $2.5 billion. Thus, combined net income for the two companies is likely to be $14.7 billion from the single-family guarantee business, plus $13.5 billion (declining to $7.5 billion) on their retained portfolios, plus $2.5 billion on their multifamily insurance business, which equals $31 billion, declining to $25 billion. Each additional 10 bps increase in their G-fees would add $4.2 billion to this profitability, assuming no commensurate decline in guarantee volume.

THE GSES UNDER CONSERVATORSHIP

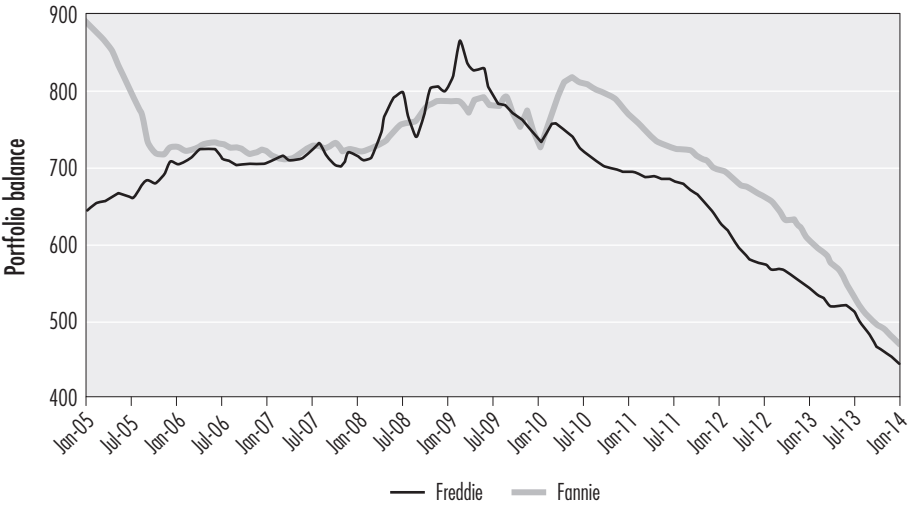
By January 2014, the GSEs' portfolios had declined from a peak of $1.65 trillion in 2008 to $900 billion (figure 8.5). Yet although they were winding down their portfolios, their role in the mortgage market was actually increasing.

Figure 8.6 shows the share of total new loans by type of lender for 2002–2013. This figure differs from figure 8.2 because it includes bank origination and excludes older loans that were securitized. By focusing on new loans, this figure clearly demonstrates the outsized role the GSEs have played. In 2002, loans originated for GSE securitization were 47 percent of the total, and FHA/VA (U.S. Department of Veterans Affairs) loans accounted for another 6 percent, for a 53 percent government share. PLS made up 13 percent of the total and bank loans another 34 percent. In 2006, the breakdown was GSE, 32 percent; FHA/VA, 3 percent; PLS, 43 percent; and bank, 22 percent. In 2007, as the PLS market shut down, banks allocated less of their portfolios to mortgage lending, and the government picked up the difference. From 2008 to 2013, the government was the major source of home credit and the only source of credit for less-than-pristine borrowers. During that time, the government share was in the range of 78–85 percent, with the GSEs making up 58–63 percent of the total and the Government National Mortgage Association (GNMA) accounting for 17–22 percent. The PLS market remained largely closed, making up less than 1 percent of the total.

Despite the increased government share in the post-crisis period, it is much more difficult for less-than-pristine borrowers to get credit during this period than was the case prior to the crisis. Freddie Mac's 30-year fixed-rate amortizing

4. Fannie Mae G-fees on new production are 63 bps; 10 bps to the Treasury for the payroll tax surcharge, 8 bps in administrative expenses, and 10 bps in losses suggests 35 bps of net income.

Figure 8.5
The GSEs' Portfolio Balance, 2005–2014 (billions of dollars)



Sources: Data from Fannie Mae (various years); Freddie Mac (various years).

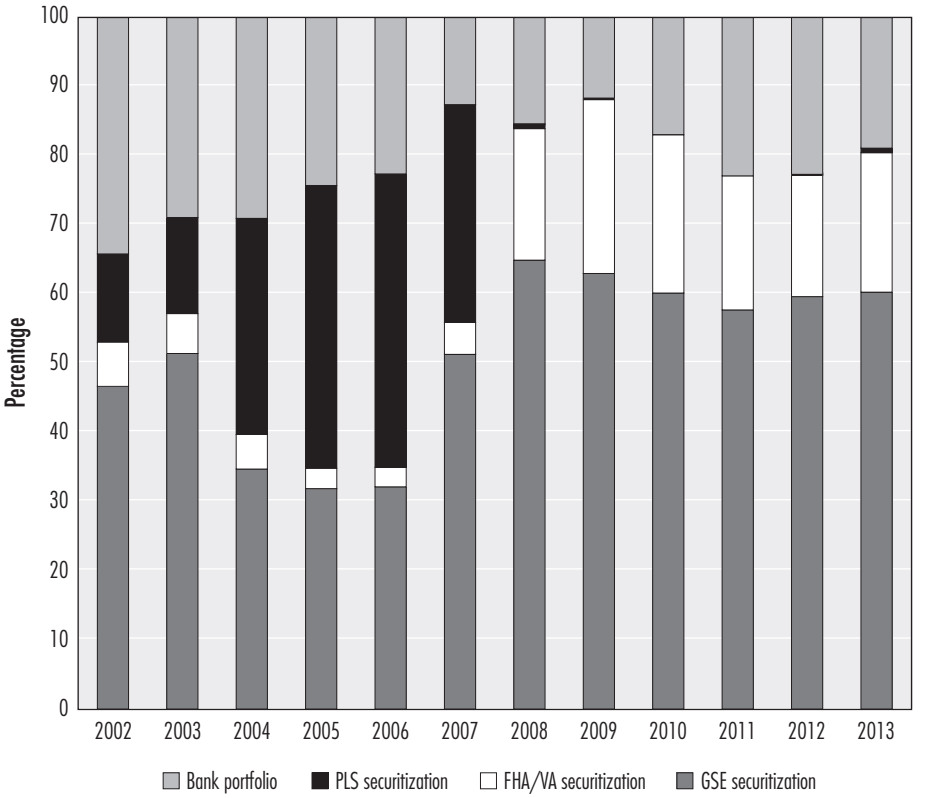
full-documentation book of business in 2012 included a much lower share of lower-FICO borrowers than in 2001 and 2007 (see table 8.2). This reflects the very tight access to credit that has prevailed since 2009.

The question is, what happens now? Fannie and Freddie continue to play an outsized role in the market, but they have been operating in a state of limbo for close to six years. GSE reform is imperative. It can happen through either legislative or administrative channels, or both.

Legislative Proposals for GSE Reform

Despite considerable frustration among critics that GSE reform was not addressed in the Dodd-Frank Act of 2010 and the Obama administration's effort to jump-start the discussion with its 2011 White Paper (U.S. Department of the Treasury and HUD 2011), Congress did not begin seriously considering the fate of the GSEs until 2013. By that time, policy makers and experts had reached something very close to a consensus that the 30-year, fixed-rate mortgage should be preserved as the instrument of choice and that a securitized mortgage market was needed to accommodate this product. Banks are unwilling to take large volumes of 30-year, fixed-rate mortgages onto their balance sheets because they have a hard time managing the interest-rate risk associated with such long-duration

Figure 8.6
First-Lien Origination Shares, 2002–2013



Note: PLS = private-label securities; FHA/VA = Federal Housing Administration/U.S. Department of Veterans Affairs; GSE = government-sponsored enterprise.
Sources: Data from Inside Mortgage Finance and Urban Institute (2014).

products. This means that widespread availability of this type of mortgage will depend on a deep and liquid securities market.

The question, then, is what role the government will need to play to create and sustain such a market. This section explains how a consensus has developed around the view that the government will have to take on the catastrophic risk of these loans in order to create the desired system and then addresses why, even with that consensus, it remains difficult to agree on the final design for such a system. The access and affordability issues are among the most difficult to resolve. Although substantial progress has been made, there is little hope that GSE reform

will be accomplished in the near future, and further efforts to move GSE reform forward seem to have come to a standstill after mid-2014.

SYSTEMS WITH AND WITHOUT A CATASTROPHIC GOVERNMENT GUARANTEE

Experts and legislators have developed a significant number of proposals to replace the GSEs with a system in which private capital would take the first loss. The proposals take two basic forms: a system in which there is no government guarantee and a system in which there is a catastrophic government guarantee. After considerable debate, a consensus has slowly formed around the second form.

The "no government guarantee" proposals are well represented by the Protecting American Taxpayers and Homeowners (PATH) Act of 2013 (H.R. 2767), introduced by Representative Jeb Hensarling (R-TX) and passed by the House Committee on Financial Services, which voted along party lines. The bill was never brought before the full House of Representatives for a vote. This bill recommended winding down the GSEs within five years. A national mortgage market utility would be created to encourage standardization and continue the FHFA's mission of providing a common securitization platform for MBS. There would be no government guarantee. The bill contains no affordable housing provisions. It also reduces the role of the FHA to apply only to first-time home buyers and low- and moderate-income buyers.

The "catastrophic government guarantee" proposal is well represented by the Housing Finance Reform and Taxpayer Protection Act of 2014 (S. 1217), introduced by Senators Tim Johnson (D-SD) and Mike Crapo (R-ID). The Johnson-Crapo bill owes a heavy intellectual debt to Senators Bob Corker (R-TN) and Mark Warner (D-VA), who initially introduced the bill in 2013. Using the Corker-Warner version as a base, Senators Johnson and Crapo conducted hearings and meetings with market participants, then introduced a bill that passed the Senate Committee on Banking, Housing, and Urban Affairs (also known as the Senate Banking Committee) with bipartisan support. This bill was never introduced to the full Senate. The bill set up a new regulatory entity, the Federal Mortgage Insurance Corporation (FMIC), which would administer the securitization platform and provide a catastrophic government guarantee on mortgages that meet its rules. In front of the catastrophic insurance stands a minimum of 10 percent private credit enhancement, provided through either bond guarantors or the capital markets. The FHA's role would remain unchanged.

Other variants of the catastrophic government guarantee proposal included a bill floated by Representatives John K. Delaney (D-MD), John Carney (D-DE), and Jim Himes (D-CT) and a discussion draft floated by Representative Maxine Waters (D-CA). Since the Johnson-Crapo bill had garnered the most support, it is used here for exemplary purposes.

The PATH Act and the Johnson-Crapo/Corker-Warner bill have several similarities, as economics professor Lawrence J. White points out in Kravitt et al.

(2014). Both bills would wind down the GSEs within five years, although Johnson-Crapo has numerous protections to lengthen the transition if certain goals are not met. Both bills encouraged standardization in MBS and a common platform. The major differences are (1) the catastrophic government guarantee; and (2) affordable housing provisions (PATH has no such provisions; Johnson-Crapo does). In addition, PATH sought to limit the FHA's role, while Johnson-Crapo left the FHA unchanged. Table 8.3 compares the two plans.

Legislators have developed a consensus around the need for a catastrophic government guarantee, as that would be the only way to preserve the to-be-announced (TBA) mortgage market, in which large numbers of securities would trade with disclosure of the mortgage type and interest rate, but no disclosure of the properties of the underlying loan. Investors fear that under the PATH Act, there would be different amounts of credit risk in pools of loans enhanced by different entities. Therefore, even though the product would be standardized, the credit risk would not. The securities would thus be unlikely to trade interchangeably, making it very difficult to envision a TBA market.

The TBA market would benefit both investors and borrowers. By removing the credit risk, the government guarantee would ensure a large supply of a homogeneous product attracting a wide range of investors, who would create a very liquid market with narrow bid-ask spreads. The liquid market would ultimately benefit borrowers, because investors would demand less of a risk premium to hold these securities, resulting in lower mortgage rates. Moreover, the liquid market would allow mortgage originators to hedge the risk that mortgage rates will rise, enabling borrowers to lock in rates well before they close a loan with the originator. Without rate locks, borrowers would find out their mortgage rates at the time of closing.

In short, while it would be possible to offer a 30-year mortgage with a completely private market such as that proposed under PATH, this market would be inefficient, and mortgage rates would be quite high. Zandi and deRitis (2014) estimated the impact on mortgage rates under PATH and Johnson-Crapo for a typical GSE borrower (FICO score 750, LTV 80).[5] Their work is summarized in table 8.4, which shows that Johnson-Crapo would have raised rates by around 41 bps (based on some liberal assumptions about the form of capital), while PATH would have raised them by 174 bps.

It is worth going through Zandi and deRitis's calculations in some detail. Under the current system, as shown in table 8.4, as of March 2014, a pristine mortgage faced about 53 bps in G-fees, assuming 23 bps for the implied cost of capital + 10 bps for administrative costs + 10 bps of expected losses + 10 bps for

5. While this may be a typical GSE borrower today, this is not the typical first-time home buyer. Nor does this description capture coming changes in demographics, potentially increasing the number of African American and Hispanic borrowers, who have traditionally had lower credit scores and been able to provide smaller down payments.

Table 8.3
The Johnson-Crapo and PATH Reform Plans

	Johnson-Crapo Bill	PATH Act
Title	Housing Finance Reform and Taxpayer Protection Act of 2014.	Protecting American Taxpayers and Homeowners Act of 2013.
Summary	Private sector entities originate and service mortgages and issue MBS. Other private sector entities provide credit enhancement. The Federal Mortgage Insurance Corporation (FMIC), a public entity, is the guarantor of last resort and absorbs catastrophic risk. It also provides the securitization platform and regulatory oversight.	Eliminates the GSEs through receivership, eventually creating a fully private market (outside the Federal Housing Administration, or FHA, which has a restricted scope for low- and moderate-income and first-time buyers). Establishes a nonprofit utility that will develop best practices and standard agreements for the private market and operate a securitization utility.
Who issues qualifying MBS?	Private lenders.	Private lenders.
Who insures qualifying MBS?	Private enhancers.	Private enhancers.
Form of private capital	Private MBS insurance companies and capital markets.	Private insurance companies and capital markets.
Affordable housing goals/allocation	Yes. Average user fee of 10 basis points (bps) on all mortgages securitized by the FMIC. Money is split: 75% to the Housing Trust Fund (primarily low-income rentals), 15% to the Capital Magnet Fund (funds for community development financial institutions and nonprofits), and 10% to the Market Access Fund (responsible lending to underserved communities). Actual user fee for each guarantor/aggregator determined by how well the entity does in serving underserved markets.	No. Repeals GSE affordable housing goals. There is no responsibility to fund any affordable housing trust funds.
First loss	Borne by private capital, sized to 10% capital.	Borne by private capital.
Catastrophic guarantee/regulator	Federal Mortgage Insurance Corporation (FMIC).	—
Countercyclical provisions	If the Treasury Department and HUD secretaries and the Federal Reserve Board agree, the FMIC can lower capital requirements for six months and then for two additional nine-month periods within any three-year period.	The FHA's countercyclical role is preserved by allowing it to insure loans to any borrower during periods of significant credit contraction (as certified by an independent government credit availability metric).

(continued)

Table 8.3 *(continued)*

	Johnson-Crapo Bill	PATH Act
Multifamily?	Yes. Government would continue to function as an insurance provider for securities backed by multifamily properties.	FHA Multifamily only, which will be limited to housing for low- and moderate-income families. The private market that replaces the GSEs will not have a multifamily mandate.
Affordability requirement for multifamily?	Yes. Sixty percent of rental housing units financed would be available to families at or below 80% of the area median income at origination.	Yes.

Source: Urban Institute (2014).

the payroll tax surcharge. Under Johnson-Crapo, the G-fees would be 109 bps, including the same 10 bps for administrative costs and expected losses. The implied cost of capital, however, would be 69 bps (46 bps higher).[6] While there would be no payroll tax surcharge, the cost of the catastrophic government guarantee would come from 10 bps paid into the Mortgage Insurance Fund and an additional 10 bps paid into the Affordable Housing Trust Funds to support both rental and owner-occupied affordable housing. The costs under Johnson-Crapo would be partially offset by the fact that the securities would have a full-faith-and-credit government guarantee; hence they would trade better in the secondary market than securities with an implied guarantee. (As evidence, GNMA securities, which have a full government guarantee; trade better than Fannie and Freddie securities, which do not.) Assuming this differential was 15 bps, there would be a 41 bps increase in mortgage rates (109 bps guarantee fee under Johnson-Crapo – 15 bps due to full faith and credit guarantee – 53 bps guarantee fee under the current system).

Under the PATH Act, mortgage rates would rise much more. The guarantors would need a higher return on equity—say, 25 percent pretax; the securities would have both a risk premium and a liquidity premium; and the cost of funds would be higher. Zandi and deRitis estimated the cost of capital at 123 bps,

6. This was calculated assuming 10 percent capital, broken down as follows: 3 percent common equity (12 percent after-tax cost of this equity), 1 percent preferred equity (7 percent after-tax cost of preferred equity), 3 percent debt (300 bps over Treasuries), and 3 percent present value of G-fees.

Table 8.4
Mortgage Rates Under Different Housing Finance Systems (basis points)

	Current GSEs	Johnson-Crapo	PATH	Precrash GSEs
Total rate	453	494	627	420
Guarantee fees	53	109	142	20
Cost of capital	23	69	123	—
Administrative costs	10	10	10	—
Expected losses	10	10	9	—
Payroll tax surcharge	10	—	—	—
Mortgage Insurance Fund	—	10	—	—
Affordable Housing Trust Funds	—	10	—	—
Yield on mortgage-backed securities	350	335	435	350
Servicing and origination compensation	50	50	50	50
Rate difference between this and current GSEs	**—**	**41**	**174**	**–33**

Source: Zandi and deRitis (2014).

100 bps over the present system.[7] The administrative costs and expected losses would be approximately the same, but the 10 bps payroll tax surcharge would be eliminated. The main issue would be how much of a risk premium (due to financing and liquidity considerations) investors would require to hold PLS versus government-backed securities. Zandi and deRitis assumed that 85 bps would be required, which would result in mortgage rates 174 bps higher than current rates (100 bps higher capital charge + 85 bps higher investor rates – 10 bps payroll tax surcharge) and 133 bps higher than those under Johnson-Crapo. The numbers are sensitive to the assumptions, but the bottom line is that a system with no government guarantee would cause mortgage rates to rise significantly.

This finding has implications for the government share of mortgage lending. Under PATH, mortgage rates would rise sharply, and there would be no affordable housing goals. As Zandi and deRitis (2013) have pointed out, more mortgages would be held on bank balance sheets, most likely in the form of more-bank-friendly adjustable rate mortgages. With the projected rise in rates, the FHA would become the sole source of affordable lending, thus transferring the entire risk to the government. Under Johnson-Crapo, some of the highest-quality mortgages would be likely to end up on bank balance sheets. More mortgages to higher-LTV

7. This was calculated assuming 5 percent capital, all equity. Equity was assumed to require a 25 percent pretax return.

borrowers would be likely to end up with the FHA, but the effect would be much more muted.

THE CONSENSUS: WE NEED A CATASTROPHIC GOVERNMENT GUARANTEE

Given that the bills proposed by Johnson and Crapo/Corker and Warner; Delaney, Himes, and Carney; and Waters all include a catastrophic government guarantee, that is the type of bill referred to as the consensus framework in this chapter. Most, but certainly not all, congressional representatives are on board with this view. The same framework has been proposed by the Bipartisan Policy Center (Housing Commission 2013); Mortgage Finance Working Group (2011); Mosser, Tracy, and Wright (2013); and Seidman and colleagues (2013). Since the GSEs were taken into conservatorship, many other plans have been advanced as well. Griffith and the CAP Housing Team (2014) summarized 27 of those plans; their work makes the consensus even more apparent.

The consensus framework includes the following seven principles.

- The 30-year, fixed-rate mortgage must be preserved.
- Private capital must take the first loss.
- A catastrophic guarantee is necessary to preserve the TBA market.
- A catastrophic government guarantee is best done through a Federal Deposit Insurance Corporation–type fund.
- The liquidity of the TBA market is best served with a single platform or a single security.
- The platform/bond administration functions should be separated from the risk-taking activities.
- Some type of affordable housing features—ensuring access to credit for underserved borrowers and underserved communities—are necessary.

THE TOP TEN DESIGN ISSUES

Before GSE reform can move forward, legislators must reach a consensus on the following major design issues.[8] As the experience with Johnson-Crapo demonstrates, however, constructing a bill that compromises in the middle means losing both the right and the left.

- What form will the private capital that absorbs the first loss take: a single guarantor (a utility), multiple guarantors, or multiple guarantors along with capital markets execution? How much capital will be required?
- Who will play what role in the system? Will the same entity be permitted to be an originator, an aggregator, and a guarantor?

8. Many of these issues are discussed in Kravitt et al. (2014), specifically in the sections by Adam LaVier and the author of this chapter.

- How will the system ensure that historically underserved borrowers and communities are well served? To what extent will the pricing be cross-subsidized?
- Who will have access to the new government-backed system (i.e., will there be loan limits)? How big should the credit box be, and how does that box relate to the FHA?
- Will mortgage insurance be separate from the guarantor function? (It is separate under most of the proposals, but in reality both sets of institutions are guaranteeing credit risk. The separation is a relic of the present system, in which, by charter, the GSEs cannot take the first loss on any loan above 80 LTV. However, if the same entities could be both mortgage insurer and guarantor, capital requirements would have to be higher to adequately protect the government and, ultimately, the taxpayers.)
- How will small lenders access the system? (All of the proposals attempt to ensure access, some through an aggregator dedicated to smaller lenders—a role the FHLBanks could play.)
- What countercyclical features should be included? If the insurance costs provided by the guarantors are "too high," should the regulatory authority be able to adjust capital levels to bring down mortgage rates? Should the regulatory authority be able to step in as an insurance provider?
- Will multifamily finance be included? How will that system be designed? Will it be separate from the single-family business? (The multifamily features embedded in Johnson-Crapo had widespread bipartisan support, but if single-family only legislation is passed, it is unclear what would happen to the GSE multifamily programs, and the support for standalone multifamily legislation is unclear.)
- The regulatory structure for any new system will inevitably be quite complex. Who will charter new guarantors? What will the approval standards be? Who will do the stress tests? How will the new regulators interact with existing regulators? What enforcement authority will it have concerning equal access goals? What will be the extent of data collection and publication?
- What will the transition look like? How will the system move from a duopoly to more guarantors? Will Fannie and Freddie turn back to private entities and operate as guarantors alongside the new entrants? How will the new entities be seeded? What would be the "right" number of guarantors, and how would that number be achieved? How quickly would the catastrophic insurance fund build?

The following subsections discuss three questions in more depth: (1) what form of private capital will absorb the first loss; (2) who will play what role; and (3) how will the system serve historically underserved borrowers and communities?

What Form of Private Capital Will Absorb the First Loss? There have been proposals to provide for only one guarantor, a public utility (Mosser, Tracy, and

Wright 2013), multiple guarantors (Seidman et al. 2013), and multiple guarantors plus capital markets execution (Housing Commission 2013; Johnson-Crapo). No plan relies only on capital markets execution because of concerns about the volatility of mortgage rates. (The original Corker-Warner plan started with capital markets execution, but after concerns were raised, the plan was changed to allow both capital markets and guarantor channels.) A one-guarantor plan would not promote competition in pricing. The multiple-guarantor and multiple-guarantor-plus-capital-markets-execution plans seem to have the most traction. The initial version of Johnson-Crapo suggested both channels; the theory was that capital markets execution would attract additional capital, which would be reflected in lower interest rates. Dual execution would also avoid issues of market dominance by a few guarantors and the potential for "too big to fail" issues to emerge. However, it does have three very significant problems, as outlined in Goodman and Seidman (2014).

First, if capital markets execution were permitted, it would be in the form of either a senior/subordinated structure, in which investment-grade senior bonds would be supported by higher-risk subordinated bonds that would bear the first loss, or credit-linked notes, which would synthetically create the same effect. When changes in the financial landscape occur, prices on the subordinated tranches could change very quickly to the new level necessary to clear the market. When the price of insurance using capital markets execution becomes too high, the execution vehicle of choice would shift to the guarantors. We saw this in 2008, when the PLS market dried up completely and the mortgage market shifted almost entirely to government-chartered guarantors. The question about a new system will be, will the private guarantors have the excess capital on hand to step in quickly and provide for the lost market capacity, or will credit costs skyrocket on scarce supply, constricting credit in some environments? By allowing guarantor execution only, and allowing the guarantors to do their own capital markets transactions, as initially proposed by Seidman et al. (2013), volatility issues could be eliminated, and a wider range of capital markets providers could be attracted.

Second, bills that allow for both capital markets and guarantor execution envision that the amount of capital standing in front of the government's catastrophic guarantee would provide equal protection under both execution channels. It is unclear how one would even calibrate equal protection, making it hard to achieve in practice. Moreover, the two regulatory structures would differ, and the quality of the guarantor's capital would be higher.

Under capital markets execution, the FMIC (to use the Johnson-Crapo/Corker-Warner terminology) would act as a credit rating agency, evaluating thousands of separate transactions each year to make sure the quality of the loans over the course of the year was high enough and the amount of diversification sufficient to protect the government. And once the execution is set, there would be no mechanism to require additional capital. In a guarantor structure, the regulation would be at the entity level, as the guarantor would be on the hook to

provide insurance until it becomes insolvent. The regulator in this case would need to determine that a limited number of guarantors are adequately capitalized. In addition, the regulator would be required to regularly administer stress tests to ensure that the capital of these entities is adequate, and could require them to raise additional capital if they are found deficient. Thus, a guarantor structure would provide diversification across vintages, and the stress tests would enable the government to require that more capital be raised at the first sign of trouble. Theoretically, equivalence with the capital required for the capital markets execution could be achieved by allowing guarantors to hold less capital, or hold less equity capital, than would be required by capital markets execution alone. But again, equivalence is difficult to calibrate.

Finally, there are questions as to whether the TBA market would be preserved, as capital markets execution requires very detailed loan-level disclosure. Would this raise privacy concerns? Would this potentially compromise the homogeneity of the TBA market? In a nonhomogeneous market, the cheapest-to-deliver security would dominate the pricing, and securities with more desirable characteristics would sell as customized products, potentially causing increasing fragmentation.

Who Will Play What Role? There are three important players in agency securitizations: the securitizer, the issuer, and the aggregator. The securitizer is the entity that manages the platform and governs the form of the securitization. The issuer is the legal entity in whose name the security is registered and who is generally responsible for the sale. The aggregator is the entity that collects the individual loans into a larger pool. In current GSE swaps, the GSE is the securitizer and issuer, and the originator is the aggregator. When loans are sold into the cash window, the GSE plays all three roles. Researchers and policy makers generally agree that the securitizer should administer the catastrophic government insurance.

Who is the issuer? Should a GNMA model be used, in which the originator (or for smaller originators, an aggregator) is the issuer? Should the guarantor be the issuer? Or should the platform be the issuer, with the private guarantor providing wraparound risk coverage?

Who is the aggregator? Is it the platform, the guarantor, or another entity, such as the originator of the FHLBanks? If the aggregator is the platform, how is the guarantor selected? If it is some entity other than the platform, that entity must absorb the pricing risk during the accumulation process.

Can entities play multiple roles? In the original version of Johnson-Crapo, a single entity could be the originator, aggregator, and guarantor. In the version that passed the Senate Banking Committee, however, the originator could not also be the guarantor.

How Will the System Serve Historically Underserved Borrowers and Communities? It will be very difficult to get a bipartisan bill through Congress without provisions for meaningful access to credit or affordable housing. However, while

some legislators would like to see explicit goals restored, others also want to see language that explicitly states an entity's "duty to serve"; still others want a market-based solution, in which firms conduct their business as they see fit, but incentives are provided to encourage lending to low-income and underserved markets. These issues have proved to be among the thorniest in the debate over housing finance reform.

As mentioned earlier in the chapter, in 1992 Freddie Mac and Fannie Mae were given affordable housing goals—that is, they were required to source a fixed percentage of their book of business from clearly specified low-income and underserved markets. HUD was the mission regulator for these goals, which were ramped up over time. By 2007, the goals required that 55 percent of the GSEs' loans be directed to low- and moderate-income borrowers, 38 percent be directed to underserved areas, and 25 percent be directed to special affordable provisions (a loan could fall into more than one category). Many critics thought these goals had distorted credit allocation within the mortgage market. Moreover, the goals led market participants to play games in order to meet them, and thus the goals may not have helped increase access as intended. For example, financial institutions initially held on to goals-qualifying loans because they knew that each December the GSEs would be scrambling to meet their goals, and one GSE might be willing to pay more than the other to procure the loans. The loans could always be delivered into TBA pools, so it cost the financial institutions little to withhold these products until the final days of the year.

In 2008, as a result of HERA, the affordable housing goals were placed under the authority of the FHFA. The director of the FHFA was charged with establishing purchase money goals for three groups—low-income families, very low income families, and families that resided in low-income areas—in addition to a separate goal for refinance mortgages. On the multifamily side, two sets of goals were required: one for the number of units purchased by the GSEs of mortgages on multifamily dwellings that were affordable to low-income families, another for the number of units that were affordable to very low income families. These goals were finalized in 2009 and went into effect in 2010.

HERA also explicitly acknowledged that the GSEs have a "duty to serve" and assigned the FHFA the task of writing regulations to further define and implement that concept. In 2010, the FHFA proposed rules that charged the GSEs with a duty to provide "leadership to the market in developing loan products and flexible underwriting guidelines to facilitate a secondary market for mortgages for very low-, low-, and moderate-income families."[9] The rules were never finalized. HERA also required that the GSEs pay 4.2 bps on annual purchases into an affordable housing fund. The FHFA suspended the fee when the GSEs went into conservatorship shortly thereafter. The fee was not collected until early 2015.

9. See Michel and Ligon (2013) for a brief history of goals versus "duty to serve."

The Johnson-Crapo bill did not include either affordable housing goals or a duty to serve. However, the bill recognized the broad availability of credit as one goal of the FMIC, established the Office of Consumer and Market Access, and created a new affordable housing fee. This fee was set at an average of 10 bps on all MBS that receive a government guarantee from the FMIC. It would not apply to GNMA securities or the PLS market.

Johnson-Crapo included an incentive structure that would allow for variation in the affordable housing fee based on how well an aggregator or bond guarantor provides support for underserved communities and markets. The goals of the incentive-based fee were twofold: to ensure that "there is sufficient quality housing available" and to provide consumers with at least a portion of the benefit of the reduced fee. The idea of an incentive fee is very clever. However, the fee should be transparent, and the fee schedule should be set in advance to maximize the likelihood of the benefit being passed on to consumers (Goodman and Seidman 2014). If the fee is determined after the fact, there is little chance that the benefit will be passed on to borrowers as the loans are being extended.

Bear in mind that the Fannie and Freddie books of business included a fair amount of cross-subsidization before the housing crisis: all loans were charged similar G-fees, and higher-quality loans subsidized lower-quality ones. Beginning in 2008, the GSEs introduced loan-level pricing adjustments (LLPAs), or up-front charges on loans with various risk characteristics. These LLPAs have been increased several times, and the amount of cross-subsidization between the GSEs has been substantially reduced. None of the proposed reform bills have explicit provisions for cross-subsidies. In Johnson-Crapo, the affordable housing provisions (including the variable fee) are the only mechanisms that allow for any cross-subsidization, and hence they are central to the conversation about the bill.

THE BOTTOM LINE: THE DESIGN ISSUES ARE IMPORTANT

As we have seen, the design issues are important. It is much easier to agree on the general principle to replace the GSEs than it is to agree on the design.

While the design issues are major, they are not the only obstacles to achieving GSE reform through legislative channels. Others include the following:

- There is no sense of urgency. The current system is functioning, and the GSEs are profitable and contributing their dividends to the Treasury, which makes budget discussions a bit easier.
- Congress has higher legislative priorities, such as managing the budget, tax reform, and immigration.
- Bipartisan action requires compromise. Many legislators believe they have more to lose than to gain by compromising in this area.

Given these obstacles, any progress toward bringing back private capital will likely be made on the administrative side. The next section focuses on some

administrative actions the FHFA can take to move the GSEs forward, as well as some actions the Treasury can take to amend the PSPAs.

Administrative Actions for GSE Reform

In February 2012, Ed DeMarco, acting head of the FHFA at the time, noted that "with the conservatorships operating for more than three years with no near-term resolutions in sight, it's time to update and extend the goals and directions of the conservatorships" (FHFA 2012a, 2). His plan was appropriately titled "A Strategic Plan for Enterprise Conservatorships: The Next Chapter in a Story That Needs an Ending." That document makes it very clear that the final chapter must be legislative; only Congress can abolish or modify the charter. However, much can be done administratively to move the housing finance system forward.

The 2012 FHFA strategic plan set in place by DeMarco is divided into three parts:

- *Build* a new infrastructure for the secondary mortgage market.
- *Contract* gradually the GSEs' dominant presence in the marketplace, while simplifying and shrinking their operations.
- *Maintain* foreclosure prevention activities and credit availability for new and refinanced mortgages (FHFA 2012a, 2).

In May 2014, FHFA head Mel Watt, who had been in the job only about four months, released his strategic plan (FHFA 2014d). While his plan retains DeMarco's three-part structure, the emphasis and order are different. Watt's plan calls for the GSEs to

- *maintain* . . . foreclosure prevention activities and credit availability . . . to foster liquid, efficient, competitive, and resilient housing finance markets; *reduce* taxpayer risk by increasing the role of private capital; and *build* a new single-family infrastructure for use by the GSEs and adaptable for use by others (5).

Given the plans' similarities and subtle differences, they are discussed together in this section.

BUILDING A NEW INFRASTRUCTURE

Integral to the first pillar of the 2012 plan, building the new infrastructure, was the creation of the Common Securitization Platform (FHFA 2012a). Since the onset of conservatorship, Freddie Mac and Fannie Mae had been reluctant to make major investments in their systems, as the fate of the entities was unclear. In 2012, the FHFA believed that infrastructure investments were needed because there was no immediate resolution in sight. These investments would have several advantages: the economies of scale from maintaining one platform rather than

having Fannie and Freddie each maintain their own platform; ease of transition to a single security; and an open architecture that would allow future issuers of MBS to join the platform. These could include PLS issuers and, if there is eventually GSE reform, non-GSE issuers of securities with a government guarantee. The Common Securitization Platform would hopefully become a public utility and the backbone of the future housing finance system, whatever form that system might take. Teams from Fannie Mae and Freddie Mac are currently working on this platform.

The platform is intended to include systems and uniform standards for underwriting, disclosures, and servicing. The GSE pooling and servicing agreements would be standardized. The hope is that large parts of those standardized agreements would be able to be exported to the PLS market.

In 2014, with near-term GSE reform legislation unlikely, Watt narrowed the scope of the Common Securitization Platform to focus on meeting the needs of the GSEs' current securitization operations. The open architecture could be expanded later to accommodate others, once the form of a future state becomes clearer.

One commonly lodged complaint about the current system is that having two platforms is inefficient: it is expensive for the GSEs, and it compromises liquidity. (Freddie Mac securities are less liquid than their Fannie Mae counterparts.) Mortgage Bankers Association (2013) states, "While Fannie Mae has roughly 60 percent of the GSE MBS market, on a typical day, the trading volume in Fannie Mae MBS is ten times that of the much less liquid Freddie security. This liquidity difference makes the mortgage market less efficient and less competitive."

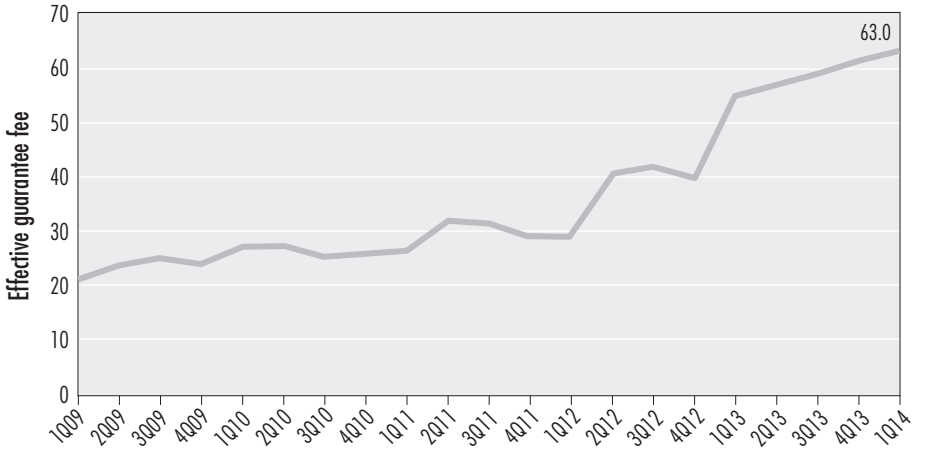
Because Freddie securities are less liquid, they trade at a lower price. Freddie must make up the difference between this price and the price of the Fannie securities in order to encourage originators to sell into Freddie. Given that GSE income is swept to the Treasury, this cost ends up being borne by taxpayers. Watt made it clear that he would like to move toward a single common security, which would require a multiyear effort before final implementation.

Thus, under Watt's leadership, building a structure that can support a single security has become a priority. The 2014 scorecard makes clear that the design principles for the Common Securitization Platform should "include the development of the operational and system capabilities necessary to issue a single (common) security for the Enterprises" (FHFA 2014c, 5). In May 2015, FHFA came out with an update on the progress toward a single security (FHFA 2015c), assuring the market that progress is being made.

CONTRACTING THE GSES' FOOTPRINTS AND RISK LEVELS

The second part of the 2012 plan has the most robust public policy implications (FHFA 2012a). The FHFA set out to gradually contract the presence of the GSEs in the market, by both shrinking their footprints and encouraging them to shrink their risks. The contraction of the footprints was to come through "crowding in" private capital by raising G-fees and, market conditions permitting, lowering

Figure 8.7
Fannie Mae Effective Guarantee Fee, 2009–2014 (basis points)



Note: The fee is the Fannie Mae single-family average G-fee charged by Fannie Mae on new acquisitions.
Sources: Data from Fannie Mae (various financial reports) and Urban Institute (2014).

loan limits.[10] The FHFA thought that by increasing costs and limiting the range of loans eligible for government support, the private market would step in, and Fannie's and Freddie's market shares would contract. G-fees have risen considerably over the past several years, increasing from 28 bps in late 2010 to 63 bps by the first quarter of 2014, as shown in figure 8.7. In December 2013, shortly before DeMarco left the FHFA, he proposed another 10 bps hike in G-fees and another round of increases in LLPAs, in order to decrease the amount of cross-subsidization in the system. Watt put the hikes on hold shortly after he took office in early 2014. He wanted time to "fully evaluate the rationale for the plan" (Timiraos 2013).

In June 2014, the FHFA put out a request for input on the base level of G-fees as well as the LLPA matrix (FHFA 2014b). G-fees must cover two components: the costs of capital and the expected losses. The capital component consists of the amount of required (or allocated) capital times the rate of return

10. In addition, as part of the 2013 strategic scorecard, actions on the retained portfolios were required. The third PSPA (2012) required the Freddie and Fannie retained portfolio caps to shrink by 15 percent per year. In its 2013 scorecard, the FHFA made it a goal for the GSEs to shrink their less liquid assets in these portfolios (nonagency MBS and unsecuritized loans) by 5 percent per year. This requirement was eliminated in the 2014 scorecard, but the GSEs were encouraged to prioritize selling their less liquid portfolio assets in an economically sensible manner to help reduce taxpayer risk.

on that capital. It should be noted that in the context of conservatorship, where a market return is not necessarily required, setting G-fees may be done without explicit cross-subsidization. A policy decision can be made to accept a market return for higher-FICO/lower-LTV loans and a submarket, but still positive, return on lower-FICO/higher-LTV loans.

In late 2013, the DeMarco FHFA had also solicited comments on lowering the conforming loan limits from $417,000 to $400,000 and lowering the maximum limit in high-cost areas from $625,500 to $600,000. This was viewed as a way to crowd in private capital. By contrast, the Watt FHFA has made it clear that this topic needs further study and there is less likely to be a change under his watch.

DeMarco's focus on shrinking the GSEs' footprints was not limited to the single-family business. Another goal in the 2013 scorecard was that Fannie and Freddie shrink their multifamily business by 10 percent relative to 2012. In August 2013, the FHFA announced that this goal was likely to be met through "a combination of increased pricing, more limited product offerings and stronger underwriting standards" (FHFA 2013b).

The second type of contraction envisioned by the DeMarco FHFA was shrinking the GSEs' risk profiles. Fannie and Freddie were encouraged to find ways to share risk with the private sector. Doing so, DeMarco reasoned, would lessen the GSEs' risk and provide valuable price discovery information. Two types of risk-sharing arrangements might be contemplated: risk sharing of loans already in the portfolios and risk sharing at the point of origination. As of June 2015, the GSEs had focused primarily on the former, the so-called back-end risk-sharing arrangements. This strategy had taken the form of reinsurance[11] and capital market transactions. As of June 2015, the GSEs had completed 20 risk-transfer transactions through the capital markets, all of which were very well received. Fannie Mae had done seven transactions through its Connecticut Avenue Securities (CAS) shelf, laying off part of the risk on $349 billion of its $2.6 trillion guarantee book of business, partially covering 13.3 percent of its book of business. Freddie Mac had done 13 transactions through its Structured Agency Credit Risk (STACR) shelf, laying off $311 billion in these deals, partially covering 20 percent of its $1.6 trillion guarantee book of business. While initially the risk sharing was on loans with LTVs of 60–80 (Lee and Bai 2014), that was broadened beginning in May 2014 to include loans with LTVs over 80. In 2015, Freddie Mac has begun to sell the first-loss risk exposure on the deals, which it had previously retained. Moreover, in 2015, the GSEs did the first deals in which their payouts were based on actual severities rather than a preset severity schedule.

11. In August 2013, Fannie purchased insurance from the National Mortgage Insurance Corporation on a $5 billion pool of mortgages already on its books. In November 2013, Freddie transferred a portion of the credit risk on its first risk-sharing deal (STACR 2013–DN1) to Arch Reinsurance. In April 2013, Freddie also bought insurance for up to $269.5 million in losses on a pool of loans purchased in the first quarter of 2013.

Fannie Mae has done several pilot front-end risk-sharing deals, in which the risk is laid off on the originator at the point of origination. That is, the originator bears the first loss, up to some prespecified amount, in exchange for a meaningful reduction in guarantee fees. It is also possible for the private mortgage insurers to take the first loss. The Mortgage Bankers Association (2013) proposed that the mortgage insurers provide deep mortgage insurance—down to an LTV of 50, for example—in exchange for a meaningful reduction in G-fees.

THE PIVOT: "REDUCE" REPLACES "CONTRACT"

The strategic path laid out by the FHFA changed considerably when the leadership changed hands in January 2014. The word "contract," used by DeMarco, was changed to "reduce" by Watt—a small but critical revision. The FHFA shifted its focus from bringing private capital back by shrinking the GSEs' footprints to bringing private capital back *within* those footprints (Parrott 2014a). Specifically, Watt embraced the risk-sharing initiatives created by DeMarco, while moving away from recommendations to crowd in private capital. The thought process: If the reasons for the lack of private capital go beyond price (for example, in PLS a number of governance/conflict of interest concerns have not been adequately addressed), further increasing G-fees will be counterproductive. Doing so will either drive more loans to the FHA, with its full-faith-and-credit guarantee, or constrict credit, neither of which would be desirable. Watt has made it very clear that there are no plans to lower loan limits. Fees and changes in LLPA proceeded slowly and gradually, with plenty of discussion and notice. In April 2015, the FHFA came out with its final decision on G-fees and LLPAs: there was a modest, revenue-neutral recalibration of GSE pricing (FHFA 2015a). Lower-credit-score, higher-LTV borrowers paid marginally less, high-balance borrowers paid slightly more. Parrott (2015) explains the intuition behind these marginal changes.

The risk-sharing initiatives have been expanded under Watt. The 2014 scorecard (FHFA 2014c) tripled the annual risk-sharing goals from $30 billion to $90 billion for each entity and added incentives to develop new structures to share the risk. The 2015 scorecard (FHFA 2015b) further expanded the risk-sharing goals to $150 billion for Fannie Mae and $120 billion for Freddie Mac. Each must utilize at least two different types of risk transfer.

The mortgage insurance industry is critical to the success of these initiatives, particularly if the risk sharing is to be done in conjunction with expanded access to credit, as is currently envisioned. In July 2014, the FHFA put out for comments the eligibility requirements for a mortgage insurer (MI) to do business with the GSEs. This document outlines the minimum financial and operational obligations; these rules include much more stringent capital requirements (FHFA 2014a). These private mortgage insurance eligibility requirements (often referred to as PMIERs) were finalized in April 2015 and posted on the Fannie Mae and Freddie Mac websites (see Fannie Mae [2015] and Freddie Mac [2015]). Finalizing these requirements gives the FHFA and the GSEs assurance that the MIs can meet the increasingly large demands being placed on them.

On the multifamily side, not only have further reductions in activity not been mandated, but lending to affordable multifamily housing was removed from the calculation of multifamily portfolio limits. This change was intended to encourage the GSEs to lend more aggressively in underserved communities facing shortages of affordable rental housing.

MAINTAINING CREDIT AVAILABILITY

GSE credit availability has been very limited under conservatorship. One reason for this is lender overlays stemming from perceptions about the GSEs' repurchase policies. When an originator makes a loan that has manufacturing defects, the GSEs are permitted to put the loan back to the originator. This is generally done when the loan has gone delinquent. As a result of the concern that the GSEs regard default as per se evidence of manufacturing defects, lenders have imposed overlays, which make the credit box far smaller than the stated GSE box (Parrott and Zandi 2013). The concern is that if lenders may have to repurchase loans that go delinquent, they will make only loans that are extremely unlikely to go delinquent.

In early 2013, the DeMarco FHFA tried to address the overlays by providing some clarification. A sunset period of 36 months was implemented for borrowers who had never missed a payment (if there was fraud, the possibility of a put-back did not sunset). However, lenders did not scale back their overlays, because it was ambiguous when the sunset period applied and when it did not. The following year, Watt (2014) announced that lenders will receive a formal letter relieving them of all liability for nonfraudulent underwriting defects if either of two events occurs:

- A borrower has no more than two 30-day delinquencies over the first 36 months after a loan has been purchased by one of the GSEs and no 60-day delinquencies.
- Fannie or Freddie have performed a quality control check on the loans and found no defects, irrespective of the age or performance of the loan.

These measures proved to be insufficient. There are certain representations and warranties that never sunset, including "misstatements, misrepresentations, and omissions," and lenders were concerned that these were not well defined, and that they undermined much of the certainty the sunsets were intended to create. In November 2014, after many discussions with lenders to better define these life of loans representations and warranties, Fannie Mae and Freddie Mac posted very granular definitions (see Fannie Mae [2014] and Freddie Mac [2014]). For example, a "misrepresentation must involve three or more loans from the same lender, be made pursuant to a pattern of activity, and be significant."

In addition, if an MI withdraws coverage on a loan, that loan will not automatically be put back to the lender, as has been done to date. The GSE will review the loan file, and if the lender has complied with underwriting requirements, the GSE will give the lender the option of finding another insurer or providing the

coverage itself. While the changes in the representation and warranty procedures may seem purely technical to many, they are critical to encouraging lenders to open the credit box.

PLACING THE FHFA'S ACTIONS IN CONTEXT

The FHFA could go a long way toward meeting many of the goals envisioned by Johnson-Crapo by taking the following actions.

- Create a more prominent role for private capital through both risk-sharing arrangements and increased reliance on MIs. (Ultimately, the role played by private capital will be well short of what it would be in a system in which private capital bears the first loss, but much larger than it was either before 2005 or under conservatorship to date.)
- Preserve the liquidity of the TBA market and ultimately enhance it by achieving the goal of a single platform or single security.
- Address affordable housing issues.

It is important to realize that the third action could be addressed more easily in the current system than it could be in a more heavily private system. Right now, the GSEs can opt to cross-subsidize the rates on loans to underserved borrowers by charging adequately served borrowers more, or they can simply choose to receive a submarket, but still positive, return on capital for loans to underserved borrowers. In the Johnson-Crapo bill, deviations from risk-based pricing for underserved borrowers would be provided exclusively through an incentive fee for an affordable housing fund. That is, the competition among private market participants would eliminate any cross-subsidization. If an adequately charged borrower is paying too much to subsidize other borrowers, a new guarantor would swoop in and take that business. One issue that eventually denied Johnson-Crapo the necessary number of votes to bring it to the Senate floor was whether the incentive fee would be sufficient to guarantee adequate service to underserved borrowers and communities, and if it was not, what the backup plan would be.

Capitalizing the National Housing Trust Fund and the Capital Magnet Fund

When it was passed, HERA required that a surcharge of 4.2 bps be imposed on every newly purchased GSE mortgage, to be contributed to two newly created funds, the National Housing Trust Fund and the Capital Magnet Fund. Sixty-five percent of the proceeds were to be contributed to the National Housing Trust Fund and 35 percent to the Capital Magnet Fund.

The National Housing Trust Fund targets rental housing; at least 90 percent of the funds must be used for the production, preservation, rehabilitation, or operation of rental property. Up to 10 percent can be used for select home ownership activities for first-time buyers. This fund focuses on low-income housing:

at least 75 percent of the funds for rental housing must benefit extremely low income households (income equal to 30 percent of area median income or less), and all the funds must benefit very low income households (income equal to 50 percent of area median income or less).

The Capital Magnet Fund was intended as a funding source for community development financial institutions (CDFIs) and nonprofits to finance affordable housing and related economic development activities. The funding was awarded competitively by the CDFI Fund and had to be leveraged at least 10 to 1 with other funding. Contributions to the Capital Magnet Fund were suspended when the FHFA put the GSEs into conservatorship, although one round of awards were made through an $80 million appropriation in 2010.

With the GSEs now profitable, the 4.2 bps fee was adopted, beginning in 2015. One consideration that may have delayed the decision was the impact that imposing the fee would have on the lawsuits against the government seeking to overturn the third amendment to the PSPAs (discussed earlier in this chapter in the history section). Does the fact that the GSEs are now profitable, and are projected to remain so for the foreseeable future, mean that this amendment should not have been adopted, thus strengthening the plaintiffs' case?

Recapitalizing the GSEs

Policy makers and experts are now debating what steps to bring the GSEs out of conservatorship can be taken through administrative actions and what must be done through legislation. Jim Millstein, the Chief Executive of Millstein & Co. and a former Treasury official, has argued that the current terms of the federal bailout prevent the GSEs from building capital. However, he points out, HERA didn't mandate either the 10 percent dividend or the dividend equal to 100 percent of the companies' earnings. "Two administrations' decisions over the past six years did. Ending the conservatorships won't require an act of Congress—HERA already provides a path to its end" (Millstein 2014). The administration could simply change the PSPAs to stop requiring dividends and let the institutions rebuild capital. After the GSEs accomplished that, the government could allow them to be sold back to private investors.

Jim Parrott, my colleague and a former adviser at the National Economic Council, has argued that this solution is not so easy to put into practice (Parrott 2014a, 2014b). Even if the GSEs might be viable, upon exiting conservatorship, without a government guarantee (itself a questionable assumption), section 6.3 of the PSPAs prohibits any change that would compromise the interests of the agency's MBS investors. And nothing would compromise the GSE MBS investors' interests more than removing the government's full-faith-and-credit guarantee. Exiting with a backstop also poses a challenge. Under the PSPAs, the taxpayers are owed a fee equal to the value of the backstop. According to Parrott, a fee equal to the fair value of the Treasury's $265 billion line of credit would be prohibitively high, particularly when added to the dividend also owed under the

agreements. Thus, as a practical matter, the GSEs cannot exit conservatorship with or without a guarantee, making legislative action necessary.

What about leaving Fannie and Freddie in conservatorship and letting them accumulate capital? The Treasury Department could amend the PSPAs to abolish the earnings sweep and restore the 10 percent dividend. If this highly unlikely course of action were taken, it is even less likely that the Treasury would count past payments in excess of the 10 percent dividend as repayment of the amount owed. Thus, even if the Treasury elected to change the PSPAs in this way going forward, with most of the one-shot earnings boosts behind them, it would take the GSEs years to repay the debt and build up adequate capital. Earlier in this chapter, it was projected that the GSEs would earn $25 billion to $31 billion annually in the coming years. A 10 percent dividend on $188 billion, the amount owed to the Treasury, is $18.8 billion. Subtracting that from the earnings estimate leaves $6 billion to $12 billion a year to use for building capital. Assuming a 4 percent capital requirement based on $4.2 trillion of assets, the size of the GSEs' guarantee business, the GSEs would need $168 billion for recapitalization, which would take them 14–28 years to accumulate. Obviously, if the dividend were reduced or eliminated, the time to recapitalization would be much shorter. With no dividend and assuming $28 billion of steady-state profits, it would take six years to accumulate $168 billion.

It also would be possible to recapitalize the GSEs through legislative action, per Millstein's plan (Millstein 2013). This possibility, too, seems remote, as there is no political will to do this. The bottom line: there is no easy exit from conservatorship, and we expect these entities to stay in conservatorship for a very long time.

Conclusions

The current state of the GSEs can best be summed up in a single word: *limbo*. Despite the fact that Fannie Mae and Freddie Mac were placed in conservatorship in 2008, with the very clear intent that they not emerge, little progress has been made toward creating a new system with a large role for private capital to take their place. It seems to be relatively easy for legislators to agree on a set of principles for a new system, but much harder for them to agree on the system's design. It is clear there will be no congressional action before the 2016 presidential election. We would be surprised if GSE reform was a top priority item after the election. As a result, we expect the GSEs to remain in conservatorship for a long time.

Given this, the major path forward over the near term will be administrative. Much, but not all, of what can be achieved by legislation can be achieved administratively. Certainly, a larger role for private capital through risk sharing and expanding the participation of the mortgage insurance industry, as well as actions to achieve a bigger credit box, can be accomplished in this way. However, the role

for private capital will fall short of what it would be if change could be achieved through legislation, and it will still leave Fannie and Freddie's status in limbo.

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COMMENTARY
William Apgar

Laurie Goodman has prepared an excellent and realistic assessment of housing finance reform. She presents what she believes to be the general consensus on the principles of Fannie Mae and Freddie Mac reform but quickly notes that there is still much disagreement concerning important design features, including particularly thorny issues relating to promoting wider access to financing for both owner-occupied and rental housing.

Following are several comments on the events that triggered the decision of the Federal Housing Finance Agency (FHFA) to place the government-sponsored enterprises (GSEs) into conservatorship and some thoughts on housing finance reform.

Triggering Events

There Were Clear Signs of the Coming Storm. As early as 2001, increasingly more poorly underwritten, often deceptive, and sometimes fraudulent loans were wreaking havoc on lower-income people and communities.

Congress Struggled to Enact Basic Reforms. Only when there was mounting evidence that the slowdown in mortgage lending was threatening the national economy and undermining the financial strength of the GSEs did Congress finally enact the Housing and Economic Recovery Act (HERA) in 2008. HERA was too little too late, but it did create the FHFA and vested the new agency with the authority to place the GSEs into conservatorship.

Conservatorship Failed to Halt the Slide. Just 40 days after the enactment of HERA, the FHFA placed the GSEs into conservatorship. Even so, financial markets continued to deteriorate. On Thursday, September 19, Federal Reserve Board chairman Ben Bernanke and U.S. Treasury secretary Henry Paulson made an urgent evening visit to Capitol Hill to meet with a bipartisan group of congressional leaders. The brutally honest message was that absent immediate and expanded intervention, the banking system would collapse under the weight of distressed assets, and this in turn would trigger a worldwide financial collapse of historic proportions.

A Crisis Is a Terrible Thing to Waste, But Congress Nearly Did. Three days after the meeting, the George W. Bush administration formally proposed what would become the Emergency Economic Stabilization Act (EESA), an expansive effort to rescue U.S. financial institutions. Among other things, EESA would provide the Fed and the Treasury additional broad authority to address the crisis

and authorize the $700 billion Troubled Asset Relief Program (TARP) to begin buying up distressed financial institutions in an effort to stabilize the banking industry.

Yet even in the face of imminent market collapse, TARP faced a chorus of criticism from both left and right. Initially, the legislation failed in the House of Representatives. The next day, the Dow Jones Industrial Average experienced the largest single-day point drop ever. Although the market rebounded the next day, the wild stock market fluctuations apparently had a sobering effect on Congress, and after several more days of debate, it passed EESA and TARP, which President Bush signed on October 3.

Reform Is a Work in Progress. The actions taken by the Fed and the Treasury helped stop the panic and slow the momentum of the financial crisis. Yet by the time President Barack Obama took office in January 2009, home values had dropped nearly one-third since October 2008. In February, Obama, using the authority contained in TARP, established a series of programs to help millions of struggling homeowners avoid foreclosure. Given the complexity of the EESA and TARP authorizing legislation, the Obama administration continued to streamline the program rules and incentives over the next several years. Though still a work in progress, these programs had led to nearly nine million mortgage modifications and other forms of mortgage assistance by the summer of 2014.

Lessons Learned from the Initial Efforts to Respond to the Crisis

First, there is no real consensus on the role of government in the housing finance market. Even when faced with the potential of major catastrophe, Congress only reluctantly responded to the mortgage market meltdown.

Second, bipartisan compromise often yields unworkable legislation. Some observe that the enactment of HERA and EESA shows that a politically divided Congress can work cooperatively to pass important legislation. To me, however, the real lesson is how partisan bickering supports an atmosphere in which even simple policy ideas often get transformed into massive and frequently ambiguous legislation.

Third, a crisis can be a strong motivator, but memories are short. This is especially true in an era when elected officials spend virtually all their time gearing up for reelection. For this reason, I believe, as Goodman suggests, that the GSEs will remain in conservatorship well beyond the presidential election of 2016.

Fourth, the FHFA is the only game in town. Goodman is correct when she observes that a Mel Watt–led FHFA could take several actions to expand access to affordable mortgages. At the top of the list would be clarifying loan repurchase issues. Although there is now a 36-month sunset period for the repurchase of nonfraudulent loans belonging to borrowers who never missed a payment,

there is no clear definition of what constitutes fraud. Watt has pledged to work with lenders to clearly distinguish minor technical errors from material, or egregious, sins of either omission or commission. This will not be easy, but creating such a standard arguably could have a significant impact on reducing the lender overlays that keep borrower costs elevated.

Fifth, Goodman and others might think about how GSE reform could be part of a larger effort to tame the national addiction to home ownership. When commenting on the ongoing political unwillingness to address important access and affordability issues, Nobel laureate Robert Shiller observed, in a 2010 *New York Times* opinion piece titled "Mom, Apple Pie and Mortgages," that perhaps policy makers should rethink the dream of home ownership itself. Among other things, Shiller points to the many risks associated with home ownership—risks that are magnified by the focus of Goodman and others on keeping the 30-year, fixed-rate mortgage as a central feature of any future housing finance reform.

Finally, expansion of the National Housing Trust Fund designed to promote affordable rental housing should be coupled with reform of the mortgage interest deduction (MID). This deduction represents the largest single federal subsidy of owner-occupied housing, but most of the benefits go to upper-income households with sufficient resources to purchase a home. Along with lax oversight, the MID enhanced the ability of the mortgage sector to market the risky loan products that were at the heart of the mortgage market meltdown. Admittedly, MID reform would be difficult, but the ongoing budget stalemate might provide an opportunity to enact one of the numerous reform proposals. The potential exists to redirect budget savings resulting from MID reform to support targeted subsidies aimed at expanding access to affordable and sustainable owner-occupied and rental housing.

Public acceptance of these ideas will take time. But as new generations of post-crisis households enter the market, they will increasingly understand the merits of having meaningful housing choices and perhaps stop chasing the dream of the 30-year, fixed-rate mortgage.

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9

An Evaluation of China's Land Policy and Urban Housing Markets

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China's land reform and changes in housing policy over the past 30 years have contributed substantially to urban expansion, industrial development, infrastructure investment, and a real estate boom. Local governments' leasing of state-owned land to businesses in urban areas for a conveyance fee to finance infrastructure investment and urban development has played a significant role in China's economic growth and urban housing market development. Since 1998, when China ended its socialistic welfare housing system, rapid development in the real estate and construction sectors has led to increases in economic activity, consumer consumption of durable goods, and infrastructure investment, as well as unprecedented urban growth. In addition, many central cities have merged with adjacent towns, smaller cities, and even counties to create large urban districts or form bigger townships and cities (Lin 2009).

The government's land policy has also resulted in some undesired consequences, such as high housing prices, local governments' overreliance on revenues from land leasing fees, increasing local government debt and financial risks, widening disparities in income and wealth, unprecedented corruption, and social and political unrest among farmers who have lost land to local government and urban dwellers who face high costs of living, congestion, and pollution.

This chapter investigates the interdependence of land policy and housing markets in China. It focuses on the analysis of the current housing market development and the impacts of government land policies on the housing market in urban areas.

Housing Reform and Housing Market Development

Shortly after the Communist Party took power in 1949, the Chinese government assumed ownership of almost all economic assets, including housing (Chen et al. 2014). Over the next 40 years, Chinese urban housing policy shifted drastically, moving from the nationalization of the housing sector between 1949 and 1978 to the nationwide privatization of housing and the development of a market-oriented system since 1988.

The transition from private to public ownership of housing has been gradually accomplished through the establishment of a residence registration system commonly known as *hukou*. By 1958, the system allowed the Chinese government to divide the entire population into two groups, those with urban residence permits and those without them. Each urban resident was linked with his or her employers or work units, commonly known as *danwei*, an economic institution in the socialist system. The *danwei* became the mechanism by which the central government controlled housing investment, construction, maintenance, operation, and allocation. Housing units were distributed among urban residents as part of a welfare package offered by their *danwei*. Distribution was based on employees' seniority, administrative ranking, occupational status, work experience, needs, merits and performance, and other factors. Housing construction was largely initiated and financed by the *danwei*, and land was allocated to them through the administrative transfer within the government's central planning system. Under this housing system in an absence of a housing market, it was the financial conditions and workplace policies of the employees' work units, instead of the workers' income and other household characteristics, that determined the size and quality and quantity of the housing consumption the urban residents could obtain. Employees were required to pay rent, but it was heavily subsidized and rent was so low in most cases that it was not adequate to cover housing maintenance costs (Man, Zheng, and Ren 2011; Wang and Murie 1996; Zhou and Logan 1996).

As a result of these policies, by 1977 the private sector's share of the housing market had dropped to 15 percent. In 1978, the per capita floor area in urban areas was only 6.7 square meters, and there was a chronic shortage of housing in most cities. Young urban dwellers had to wait for many years to get a small apartment of their own leased by their employers. For all practical purposes, private housing construction was eliminated, and the central government assumed full responsibility for housing investment through its central planning system and the *danwei* distribution channel. The government's inadequate investment in the housing sector brought about the deterioration of housing units, overcrowding, a chronic housing shortage, and poor living conditions for most urban residents.

The Chinese government started to reform the state-controlled public housing system shortly after it began its general economic reform in 1978. In 1980, it began promoting private ownership and allowed the sale of public housing to urban residents at subsidized costs. Rents were gradually raised to market level,

and private and foreign investments in housing were encouraged. Eight years later, in 1988, the government introduced nationwide privatization and commercialization, initiating the sale of existing public housing, as well as newly built housing, to employees through their *danwei* at very low prices and encouraging the private sector to participate in housing construction and development (Wang 1999, 2011; Wu 1996).

In 1998, the central government began terminating direct public housing distribution to workers and offering cash subsidies for housing to new workers in urban areas. It also began providing subsidies to selected low- and middle-income families for the purchase or lease of housing units. Higher-income families had to rely on the financial assistance available through mortgage financing to purchase housing. The *danwei* were allowed to offer housing subsidies to new employees, but they were prohibited from being directly involved in housing construction, distribution, or management (State Council 1998).

As a result of these reforms, housing was transformed from a public good and service, which was part of the government's social welfare package, to a privately owned commodity that was largely provided by the private sector in the commercial market. Since then, vigorous housing markets have developed rapidly in urban China.

The privatization of China's housing market was accompanied by rapid industrialization and urbanization. According to the data from the National Bureau of Statistics of China (NBS 2013), the urbanization rate increased from 17 percent in 1978 to 53 percent in 2013, and the demand for housing in urban areas has continued to be a driving force in the explosion of new housing construction since 1998. At the same time, rapid industrialization and urbanization have generated income growth among urban households, which has stimulated the demand for larger housing units and better quality and more comfortable living conditions. Data from the NBS (2013) show that since 1998, increases in per capita floor area have lagged behind per capita income growth in urban areas, particularly large urban areas and coastal cities, further fueling the demand for housing and causing housing prices to rise rapidly.

Privatization of the housing sector has benefited a large number of households. Many families purchased public housing from their *danwei* at a heavily discounted price or bought existing or newly constructed housing from the commercial housing market. That privatized housing stock has become an important source of wealth after decades of appreciation of urban housing value. Local governments lease state-owned land for a lump sum fee to real estate developers who seek loans from state-owned banks and financial institutions. Developers often collect down payments from home buyers to finance the construction of housing projects. When a project is completed, buyers may turn to banks for mortgage loans to complete the transaction with the developer. As a result, urbanization, income growth, and the widespread speculation of growing housing prices have driven up the demand for housing and led to rapid development of vigorous housing markets in almost all Chinese urban areas.

The Outcomes and Challenges of China's Housing Reform

One of the important outcomes of China's housing reform has been the rapid increase in housing investment and construction. As table 9.1 shows, total investment in urban real estate development increased at an annual rate of 23.3 percent on average from 1998 to 2012, growing from 361.4 billion yuan (US$55.6 billion) to 7.18 trillion yuan (US$1.1 trillion). (These and other conversions in this chapter are based on an exchange rate of 6.5 yuan to US$1.) The total accumulated investment in urban real estate during this period was 36 trillion yuan (about US$4.6 trillion). Investment in residential buildings increased from 208.2 billion yuan (US$32 billion) to 4.9 trillion yuan (US$760 billion), at an average annual growth rate of 26.2 percent between 1998 and 2012. The total accumulated investment in housing reached 25 trillion yuan (about US$3.87 trillion) from 1998 to 2012.

Table 9.1
Results of the Chinese Housing Reform in Urban Areas, 1998–2012 (annual percentage increase)

	Total Real Estate Investment	Residential Investment	Floor Area of Residential Buildings	Average Selling Price of Residential Buildings
1998	13.71	35.22	17.43	3.58
1999	13.53	26.75	17.33	0.16
2000	21.47	25.53	–1.81	4.90
2001	27.29	27.32	4.77	3.54
2002	22.81	23.98	4.03	3.72
2003	30.33	29.63	–8.06	5.02
2004	29.59	30.40	3.50	18.71
2005	20.91	22.90	16.25	12.62
2006	22.09	25.57	–4.68	6.20
2007	30.20	32.02	9.16	16.86
2008	23.39	24.63	10.39	–1.89
2009	16.15	14.14	8.07	24.69
2010	33.16	32.84	5.82	5.97
2011	28.05	30.25	17.99	5.67
2012	16.19	11.40	4.70	8.75
Average Annual growth rate (%)	23.26	26.17	6.99	7.9

Source: Data from the National Bureau of Statistics (2013).

The total floor area of urban residential buildings increased from 476.2 million square meters in 1998 to 1.07 billion square meters in 2012, up 125 percent. According to the NBS (2013), between 1998 and 2012 the accumulated area of housing under construction was 32.7 billion square meters, and about 10.4 billion square meters was completed. New construction increased at an average rate of 7 percent annually during this period, a growth rate that is unprecedented in Chinese history. If all this construction is eventually completed, it will be equivalent to 48 square meters per urban resident, assuming a 53 percent urbanization rate.

As mentioned earlier, this massive construction boom has dramatically improved housing conditions, increased home ownership rates, and contributed to rapid household wealth accumulation in urban areas, and economic growth. In an examination of China's Urban Household Survey data for 2010, Man, Zheng, and Ren (2011) found that the home ownership rate (defined as the ratio of owner-occupied housing units to total housing units) for urban areas was 84.3 percent, exceeding that in many developed countries, including the United States (where it is about 66 percent). Even urban households in the lowest 10 percent income group have achieved an impressive 79.3 percent home ownership rate nationwide. In 2010, the average floor area per household was 92 square meters, and the average floor area per capita was 32 square meters, much higher than the 6.7 square meters per capita in 1978. About 40 percent of the formal housing stock in urban areas was distributed and allocated through the commercial housing market.

The impressive outcomes of China's housing reform have been offset by skyrocketing prices, which have made housing unaffordable for many middle- and low-income households and for young people in several coastal cities (Wang and Murie 1999, 2000). In addition, the housing boom has created a huge wealth disparity between homeowners and non-homeowners and between urban and rural residents. As table 9.1 shows, the average selling price of residential buildings (measured as a ratio of total sales revenue to total floor area) went up 8 percent annually between 1998 and 2012. The nationwide average selling price of new residential buildings increased from 1,854 yuan (US$285) to 5,430 yuan (US$835) per square meter, up 200 percent between 1998 and 2012 (NBS 2013). This figure is grossly underestimated, however, because data failed to reflect differences in quality, location, and other attributes. In fact, there were double-digit price increases nationwide in a number of years. It is also very likely that in some urban areas, such as coastal cities, housing prices increased even more than the national average. According to the Large-Sample Urban Household Survey conducted by the NBS, the mean housing price in more than 600 cities increased 58 percent between 2007 and 2010, and the mean housing price per square meter went up 46 percent during the same period (table 9.2). These results present a more accurate picture of the housing situation in China because they reflect the price of the existing stock in a large sample of households. Table 9.2 also shows that the home ownership rate increased from 82.3 percent in 2007 to 84.3 percent in 2010.

Table 9.2
Urban Housing in China, 2007 and 2010

	2007	2010
Mean housing price nationwide (yuan)	281,000	445,000
Mean housing price per square meter (yuan)	3,325	4,844
Home ownership rate (%)	82.3	84.3
Dwelling size per household (m^2)	84.5	91.9
Dwelling size per capita (m^2)	28.3	31.7

Source: Large-Sample Urban Household Survey by the National Bureau of Statistics of China (2007 and 2010), and Man, Zheng, and Ren (2011).

As urban housing prices have experienced double-digit annual growth since 2005, housing affordability has become a major issue in a number of large Chinese cities, particularly in coastal areas. According to UN-Habitat's Global Urban Observatory databases, housing price–to–income ratio (PIR) is one of the indicators of urban housing affordability. UN-Habitat regards ratios of 3 to 5 as normal or satisfactory. Using median housing value and income data for 600 Chinese cities (from about 500,000 households) from the Large-Sample Urban Household Survey, Man, Zheng, and Ren (2011) found that the PIR in urban China increased from 5.56 nationwide in 2007 to 7.07 in 2010. These ratios fall into UN-Habitat's "severely unaffordable" category. This finding indicates that the median housing price in these cities is equal to more than seven years of a typical household's median income.

Chinese governments have been called on to increase the availability of affordable housing to middle- and low-income households in urban areas. They have also attempted to stabilize urban housing prices, discourage speculation, promote construction of smaller and cheaper housing units, and control the possible financial risks associated with the housing sector. Despite issuing a series of policies and mandates, the central government has achieved very limited success in these endeavors and continues to face enormous challenges in providing affordable housing.

In China, affordable housing is commonly known as *jingji shiyong fang*, economical and comfortable housing (ECH), and *lianzu fang*, low-rent public housing (LRH). This housing is designed for middle- and low-income residents, including public sector employees and the urban poor. In some cities, such as Beijing, it also includes price-controlled commercial housing, which is restricted in size and price in order to qualify for reduced land use fees and favorable land allocation by the government. This type of housing is intended to help low- and middle-income families become homeowners. In 2005, the Chinese government began to encourage the development of low-rent public housing targeted at fami-

lies with monthly per capita incomes below the municipal poverty line and families whose current floor area per person is less than the minimum standard set by the municipal government.

In general, the central government sets policies and mandates with respect to affordable housing, and the subnational governments, particularly cities, are responsible for the construction, financing, and management of the housing. The central government does not provide financial support to provincial and local governments for affordable housing except in the fiscally strained and underdeveloped central and western regions. Local governments are required to reduce government charges and fees and to control developers' profits in order to lower housing prices for qualified households. They also must provide state-owned land to support affordable housing projects, usually appropriating land to state-owned real estate companies that finance, construct, and sell the ECH units to eligible urban households. Middle-income families seeking private-market commercial housing may receive subsidized loans from the Housing Provident Fund, to which both employees and employers contribute. Low-rent public housing is constructed, owned, and managed by local governments and is offered to poor urban families at below-market rents.

With housing prices too high even for average salary earners, the current affordable housing system faces a number of serious challenges. First, there is enormous demand for such housing. By the end of 2008, there were 7.4 million low-income urban households in need of government support for housing. In addition, according to statistics from the Ministry of Housing and Urban and Rural Development on its website, there was an estimated "floating" population of 147 million. Most are migrant workers, who often fall into the low-income group. At the current rate of urbanization, there is expected to be an increase of about 10 million people living in cities every year. Most of them will be unskilled and semiskilled workers in the low- and middle-income groups in need of housing assistance.

Second, affordable housing accounts for only a very small portion of the total housing stock. Government-sponsored low-rent housing, as well as heavily subsidized ECH units, makes up less than 10 percent of the total housing stock on average in urban areas (Man, Zheng, and Ren 2011). The underdeveloped private rental market in China further aggravates the problem of the inadequate supply of affordable housing.

Third, local governments lack the incentives and financial means to provide affordable housing. The fiscal reform of 1994 left subnational governments responsible for nearly 80 percent of total government expenditures, but they receive only 47 percent of total government revenues (Man 2011). This fiscal imbalance, as well as many unfunded central government mandates and interjurisdictional competition, has driven many local governments to rely on land leasing fees (also known as land transfer fees) to finance infrastructure investment and economic development. Local governments have little incentive to provide land for the construction of affordable housing units, preferring instead to sell the use

rights of state-owned land to the highest bidder through the tender and auction process. They also depend on the Housing Provident Fund and net land transfer revenues to finance affordable housing, both of which are unstable and inadequate revenue sources. According to a 2010 report from the Chinese National Auditing Office (CNAO 2010), some cities, including Beijing, Shanghai, Chongqing, and Chengdu, fail to collect their share (at least 10 percent) of the net land transfer fees earmarked for low-rent housing construction. In 2007–2009, a total of 14.62 billion yuan (US$2.2 billion) was not collected, accounting for about 50 percent of the 29.68 billion yuan (US$4.47 billion) that should have been collected.

Fourth, only households with city residence permits through the *hukuo* system may participate in the current affordable housing system. Migrant workers, "floating" populations, and others without urban residence permits cannot participate. These people have to find shelter in the informal housing market, such as the "urban villages" constructed by rural residents on the urban fringe. These villages offer substandard housing and sanitation conditions.

Finally, the affordable housing system suffers from poor administration, widespread corruption, and even fraud. For example, many ineligible applicants receive low-rent housing, and a number of high-income households own ECH units, which they sell or lease to make a profit. At the same time, many qualified families are denied housing assistance or have to wait years to get government support.

Since 2005, the central government has focused on a range of policies aimed at controlling housing prices, dampening the speculative behaviors of some home buyers, and increasing the construction of affordable housing. These policies have produced mixed results, and government regulations have become less and less effective in accomplishing the policy objectives. Among the main obstacles to increasing the stock of affordable housing are the central government's land policy, the resistance of local governments to lowering land prices, and the numerous taxes and fees imposed at the various stages of land and housing transactions and development.

The Role of Land Policy in China's Urban Housing Market

The development of the housing market in China over the past two decades has been driven by the reorientation of the country's urban land policy and the subsequent booming real estate market. Prior to the launch of economic reform in 1978, urban land was owned by the state and appropriated for public use at little or no cost. In rural areas, land was owned collectively by the farmers in each village. Farmers could not sell this land or use it as collateral for bank loans, however; only governments could acquire this land for public and commercial use. They often offered farmers compensation equal to the land's current agricultural use value. Land markets did not exist under the centrally planned economy of that time.

In 1987, the central government allowed the Shenzhen Special Economic Zone (SEZ) to lease its land use rights to foreign investors wishing to locate businesses there (Lin and Ho 2005). By separating use rights from ownership, local governments found a legal and effective way to lease land to for-profit companies without jeopardizing state ownership of the land. The subsequent revision of China's constitution and land-related laws and regulations in the 1990s legitimized the transfer of land use rights for nonpublic uses in urban areas, in exchange for a conveyance fee that is determined by the public tender, auction, and bidding process. State-owned land is currently leased for 40, 50, or 70 years for commercial, industrial, or residential use, respectively. The use rights of leased urban land are permitted by the Chinese government to be transferred or sold. Since the 1990s, the land and housing markets have developed rapidly in China.

Land Supply Policy

Under the current system of state ownership of urban land and collective ownership of rural land, only local governments can supply land for business uses, thus controlling the quantity, location, and use of available land. In an effort to regulate and control the land and housing markets, and consequently the level of economic development, the central government sets an annual quota for the amount of land allowed to be leased or appropriated.

The central government also issues various land policies to achieve industrial, regional, and social policy objectives. From 1997 to 2009, it allocated about 75 million *mu* of land (about 12.36 million acres) for construction and collected about 7 trillion yuan in concession fees from land use rights, which have played a key role in local economic development. However, using land as a policy instrument has its limitations, because land is non-reproductive and exhaustible. It is always more efficient and sustainable to use land and property taxes, debt financing, and other regulations to influence economic activities. As an input in the production of goods and services, land use and supply that is driven by market forces and competition leads to the best and highest use of land resources and the fairest and most efficient outcomes. Direct administrative control and allocation of land resources may lead to economic distortion and policy failure. For example, some developers and financial companies stockpile land for speculative purposes, thereby inflating land and housing prices, which has negative social and economic consequences. Moreover, although land supply policy is created by the central government, it is implemented by local governments. Because it is difficult for the central government to understand local needs and local social and economic environments, this system leads to economic distortion and counterproductivity, as demonstrated in the central planning economy. As table 9.3 reveals, between 2010 and 2012 the central government increased the land supply by 61 percent, up from 428,212 hectares to 690,400 hectares. In 2012, 46.8 percent of the land supply was leased through the tender and auction process. Only 16 percent, or 110,800 hectares, was used for housing, down from 26.7 percent

Table 9.3
Share of Total Land Supply by Use, 2010 and 2012

	2010 Hectares (% of total)	2012 Hectares (% of total)
Total land supplied	428,212 (100)	690,400 (100)
Land leased	291,500 (68.1)	322,800 (46.8)
Land appropriated	136,000 (31.9)	362,600 (53.2)
Industrial, mining, and storage	152,722 (35.7)	203,500 (29.5)
Real estate construction	153,100 (35.8)	160,300 (23.2)
Commercial uses and services	38,700 (9.0)	49,400 (7.2)
Housing	114,400 (26.7)	110,800 (16.0)
Public facilities and transportation	122,370 (28.6)	326,600 (47.3)
Social housing	20,600 (3.2)	31,700 (4.6)

Source: Based on data from the Ministry of Land and Resources. *www.mlr.gov.cn/mlrenglish/*.

in 2010. Land appropriated for social housing projects accounted for less than 5 percent of the land supply in 2012. Table 9.3 shows that the majority of the land supplied by the government was used for public facilities and transportation, as well as for industry, mining, and storage, instead of for housing, thus leaving the high demand for housing, skyrocketing housing prices, and the need for more affordable housing largely unaddressed.

Land Leasing Fees

Local government officials are evaluated on the basis of the GDP and tax revenue growth achieved during their tenures. Facing the challenges of GDP targets, capital expenditures for industrial development and infrastructure investment, and the fiscal gap between own-source revenues and public expenditures, local governments turn to land, their largest and most valuable asset, as a development and financing tool. This use of land is made possible by the 1998 Land Administration Law, which gave the right of approval and supervision of the use of urban and rural land to the central and provincial governments, and assigned the right of implementation to the city and county governments.

As mentioned previously, local governments have strong incentives to provide subsidized land for industrial and commercial use in order to achieve higher GDP and tax revenue growth. At the same time, in order to maximize land conveyance fees, it is in the interest of local governments to limit the supply of land for residential use, which serves to increase the bidding price of land leased for housing. The conveyance fees commonly known as land leasing fees or land transfer fees, which are collected from businesses that wish to lease land from local

governments, have become a significant revenue source for these governments (Cao, Feng, and Tao 2008; Man 2011; Peterson 2006). By using the mechanism of public tender and auction, they are able to maximize revenue from leased land. Not surprisingly, this has led many cities to set up industrial parks and economic development zones, which allows them to attract businesses by offering a large amount of land at a very low price, as well as various tax and financial incentives. At the same time, local governments act as a monopoly, limiting the supply of land for residential use in order to push up the price. In addition, the levy and use of land leasing fees are largely determined by local governments and receive little scrutiny from the central governments; as a result, in many regions, land leasing has become the single most important source of local government revenues.

Studies consistently show that land leasing fees amount to 30–50 percent of subprovincial government budgetary revenues, and in some regions they make up 50–60 percent of city revenues (Man 2011). As table 9.4 shows, land leasing fees increased dramatically from 1999 to 2012. In 2012, local governments

Table 9.4
Land Leasing Fees, 1999–2012

	Land Leasing Fees	Ratio to Local Government Budgetary Revenues	Ratio to National Government General Revenues	Share of GDP
	(100 million yuan)	(%)	(%)	(%)
1999	521.7	9.3	4.6	0.6
2000	624.9	9.8	4.7	0.6
2001	1,318.1	16.9	8.0	1.2
2002	2,454.3	28.8	13.0	2.0
2003	5,705.8	57.9	26.3	4.2
2004	6,458.8	54.3	24.5	4.0
2005	5,941.7	39.3	18.8	3.2
2006	8,109.1	44.3	20.9	3.8
2007	12,247.2	52.0	23.9	4.6
2008	10,414.4	36.4	16.9	3.3
2009	17,285.1	53.0	25.2	5.1
2010	27,512.8	71.7	35.0	7.3
2011	32,176.7	61.2	31.0	6.8
2012	28,517.0	46.7	24.3	5.5
Total	160,000.0			

Source: Based on data from the Yearbook of Land Resources and the Chinese Ministry of Finance. *www.mlr.gov.cn/mlrenglish/*.

collected a total of 2.85 trillion yuan (US$438 billion) in land leasing fees, reaching 46.7 percent of local government budgetary revenues, 24.3 percent of national government general revenues, and 5.5 percent of GDP. It indicates that land leasing fees generate an amount of extra-budgetary revenue that is equivalent to nearly half of local budgetary revenues. For example, if local governments collect US$100 million from taxes and fees, they will receive an additional levy of US$50 million from land leasing fees. By contrast, in 1999 land leasing fees were only 9.3 percent of local government budgetary revenues, 4.6 percent of national government general revenues, and 0.6 percent of GDP. During the period from 1999 to 2012, a total amount of 16 trillion yuan (about US$2.5 trillion) has been generated from leasing use rights of state-owned land to businesses, and a large share of the revenue has been used to finance infrastructure investment and urban development.

The Impact of Land Policy on Housing Prices

As discussed in the previous sections, the development of the housing market in China over the past two decades has been greatly influenced by the land policy carried out by the central and subnational governments. On one hand, the real estate and construction sectors are viewed as important engines of economic growth. Increasing amounts of state-owned urban land have been provided for the construction of residential buildings, and home ownership has been encouraged as a national strategy for achieving economic growth. Housing reform has paved the way for market-oriented development and financing of urban housing and consequently a booming housing market in the past two decades. On the other hand, local governments rely heavily on land leasing fees to finance infrastructure development and public goods and services. To generate higher leasing fees, and thus more extra-budgetary revenue, they use the mechanism of public tender and auction to bid up the price of land, which in turn leads to higher housing prices.

According to data collected by the NBS, construction costs of housing increased from 1,218 yuan (US$187.4) in 1998 to 2,498 yuan (US$384.3) in 2012, a jump of 105 percent. Housing prices, however, increased from 1,854 yuan (US$285.2) to 5,430 yuan (US$835.4), or 193 percent (NBS 2013). Factors such as land price may well have contributed to the rapid rise in housing prices. This hypothesis may be tested by estimating the relationship between housing prices and land prices as follows:

$$\text{LHOUSEPRICE}_{it} = \alpha + \beta\text{LLANDPRICE}_{it} + \delta Z_{it} + \varepsilon_{it}$$

where LHOUSEPRICE_{it} is the average price of commercial housing per square meter for i provinces and t time periods in the form of a logarithm;

LLANDPRICE_{it} is the average land price for residential use per square meter through the public tender, auction, and bidding process;

Table 9.5
Regression Results of the Housing Price Estimation Equation

Explanatory Variable	Coefficient	Beta	t-statistic	Standard Error
LLANDPRICE	0.182	0.30	8.33	0.02
LLINCOME	1.03	0.71	20.16	0.05
LPOP	–0.10	–0.20	–7.20	0.01
Constant	–2.0	NA	–4.73	0.42
Observation = 186				
F = 398				
R^2 = 0.868				

Note: The dependent variable, LHOUSEPRICE, was the average sales price of newly constructed commercial housing per square meter at the provincial level from 2003 to 2008 in the form of a logarithm.
Source: Data from the National Bureau of Statistics (2013).

Z_{it} is the vector of other factors affecting the average selling price of housing, such as population size, disposable income, and urbanization rate, among others; and

ε_{it} is the error term.

The regression results from the estimation of housing price equation reported in table 9.5 indicate that the most important factor in predicting housing prices was disposable income. The income elasticity of the demand for housing was 1.03, indicating that a 10 percent increase in disposable income will lead to 10.3 percent increase in housing price. It is safe to say that housing is a necessity good for most urban residents. The second most powerful predictor of housing prices was land prices. That variable was positively correlated with housing prices with a coefficient of 0.18, which was statistically significant. It provides empirical evidence that the higher the bidding price for land, the higher housing prices will be. A 10 percent increase in the bidding price of residential land will lead to a 1.8 percent increase in average housing price per square meter, after controlling for other factors. The population variable had a negative and statistically significant coefficient, suggesting that the bigger the city, the more heterogeneous the housing market and the slower the growth in per square meter housing prices will be. This variable is more likely to measure the city's attributes and local housing supply conditions.

This result supports the hypothesis that local government behavior of leasing land rights to the highest bidder for the purpose of maximizing conveyance fees has led to higher housing prices and thus a shortage of housing that is affordable for ordinary urban residents. To ensure sustainable economic development in

China, this infrastructure financing mechanism should be replaced with a modern property tax system and debt financing.

Conclusions

This study of the evolution of land and housing policies in China over the past 30 years reveals that separating land use rights from ownership has led to the rapid development of land and housing markets in urban areas, which has in turn led to urban expansion, rapid urbanization, and economic growth. China's housing reform through privatization of public housing and marketization for housing provision has helped hundreds of millions of people become homeowners, live in more spacious and comfortable dwellings, and accumulate wealth. However, the increased demand for housing in coastal areas and big cities, and the bid-up land price for residential uses, has drastically pushed up the price of housing in China. As a result, housing has become less and less affordable for low- and middle-income families, the urban poor, and younger people entering the workforce. Although the central government has tried to establish an effective affordable housing system, the local governments have little incentive to carry out the central government's mandates and policies. Rather, it is in their interest to maximize land leasing fees, which in turn drives up land and housing prices (Cao, Feng, and Tao 2008).

The use of land supply as a policy instrument leads to a huge distortion in economic development and housing markets in China. The overreliance on land leasing fees to finance infrastructure investment and urban development is risky and unsustainable. The regression analysis presented in this chapter suggests that land prices and disposable income have significant impacts on housing prices. The empirical evidence indicates that the growing cost of land, determined through the public tender, auction, and bidding process, is being shifted to home buyers in the form of higher housing prices. To prevent housing prices from increasing further and to strengthen the affordable housing system, local governments need to reduce their reliance on land leasing fees as a revenue source, reform the current property tax structure, and establish a sustainable local public finance system.

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COMMENTARY

David Geltner and Xin Zhang

The stability of housing markets has become an important topic for scholars, policy makers, and investors around the world since the subprime mortgage crisis began in the United States in 2007. In China, there is widespread concern that the housing price boom that has persisted in the largest cities since 2006 may be a bubble. In places such as Beijing, real housing price appreciation has occurred in excess of that which has occurred historically worldwide in other markets that are widely agreed to have exhibited bubbles.

China is particularly interesting because its housing market has unique characteristics not found in conventional markets such as those in the United States and Europe. The rate of urban expansion in China has been remarkable by any historical standards. Nearly 500 million people have been urbanized in the past three decades, and the process continues apace, with another 300 million expected to move to cities in the next two decades. With per capita real incomes growing at or near double-digit rates annually during this period, the demand for more and better housing has been astronomical, and the supply has largely kept pace. At the same time, there are special features that particularly apply to the Chinese housing market in this rapid changing environment. For example, the nature and importance of central government control and policy interventions in China's housing market are unlike those in Western countries. And Chinese households face limited channels in the capital markets through which they can invest their rapidly accumulating monetary savings, which force them to invest in the housing sector.

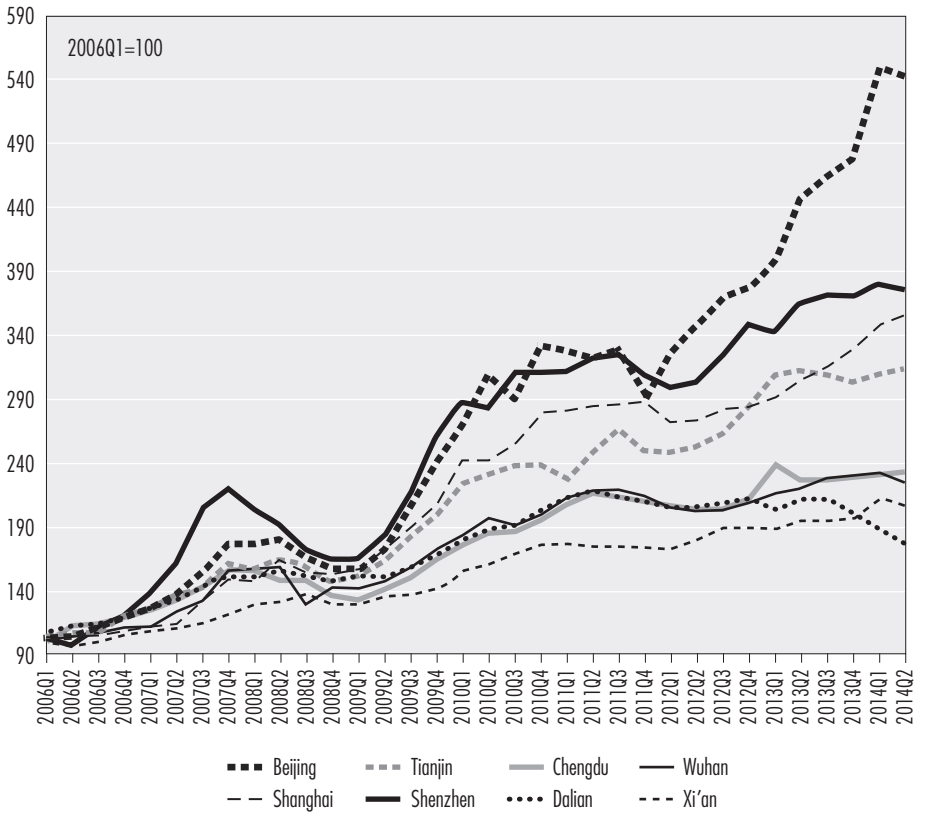
In her very interesting chapter, Joyce Yanyun Man investigates the relationship between land policy and rapidly rising housing prices in China's urban areas. She provides a useful history of Chinese housing reform, one of the most important issues of the past two decades. Along with the economic boom, it has both triggered and reflected the migration of the rural workforce to cities all over China. Man describes recent investment and construction in the residential sector, which increased at an annual rate of 7 percent on average in the years 1998–2012. She also discusses the affordable housing issue in China, which has become more and more important due to the increases in housing prices in recent years.

Man focuses on land prices and speculative investment behavior as possible causes of soaring housing prices, an explanation that is also commonly cited in the development industry. This is an excellent point, to which we would add a couple of complementary points.

First, it would be interesting to delve further into the existence, magnitude, and nature of speculative investment behavior in the Chinese housing market and the role that it plays. Such speculation is referring to the relatively well-off households that buy homes before they need them, or in some cases homes that exceed

the size (and even number) necessary for their own use. Such speculative behavior has been a major target of central government policies. For example, the government started to implement a law restricting home purchases in early 2010. This law allows each family to purchase a maximum of two housing units in first- and second-tier cities so that the speculative behavior can be controlled. A recent working paper by Sun et al. (2013) found that this policy led to a 23 percent reduction in resale home prices and a decrease of more than one-quarter in the price-to-rent ratio in Beijing. As indicated in figure C9.1, however, the pause in price growth apparently lasted only a little over a year.

Figure C9.1
Quality-Controlled Housing Price Indices for Newly Built Commodity Housing Units in Eight Major Chinese Cities, 2006–2014



Notes: The indices are constructed by Peking University–Lincoln Center for Urban Development and Land Policy and Hang Lung Center for Real Estate, Tsinghua University. Hedonic modeling is the basic methodology in constructing the indices.

Other policy changes are in progress or in the works. A new resale tax was implemented in March 2013, raising the tax on capital gains from 1 percent to 20 percent. The government also has plans to implement property taxes and introduce inheritance taxes, in part to dampen the potential housing bubble.

A second issue that Man addresses is the question of the causal relationship between land prices and housing prices. She suggests that high land prices are driving high housing prices in China. There is some truth to this view, but the residual theory of land value in urban economics suggests that the opposite possibility—that high housing prices are causing high land prices—also should be considered.[1] Do we not need evidence about the supply of land for housing being artificially constrained to conclude that land prices are driving housing prices?

The Chinese housing market is very complex and, like any market to some degree, inherently circular: not only do land prices drive housing prices, but housing prices drive land prices. The question is, what is governing the dynamic behavior of the housing system? Man's paper emphasizes the important role local governments play in the land supply market, as they determine the availability of land for residential development. This special situation in China requires going beyond traditional economic market models to understand the dynamics. System dynamics (SD) modeling may shed some light.

The simple SD model depicted in figures C9.2 and C9.3 suggests that local governments' behavior can strongly determine whether land prices drive housing prices into an inefficient upward spiral or not, depending on whether the governments' land sale behavior is aimed at a revenue-maximizing target or a fixed-revenue target. The arrows in the figures show the flow of causality among the key elements in the system. A positive relationship means that the subsequent (downstream) element changes over time in the same manner or direction as the previous (causal) element; a negative relationship indicates the opposite.

As shown in the figures, the system is described largely by two loops. The main loop is on the left, representing the fundamental housing market. It relates land prices to local government land sales behavior, which in turn affects the stock of housing on the market. The stock affects rents and housing prices and then, via the residual theory, land prices. The secondary loop on the right reflects speculative demand for housing, not as a consumption good for its use in providing housing services, but merely as a store of money. This loop tends to reinforce whatever is happening in the main fundamental housing market loop, and thus it can cause the results to be magnified.

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1. The residual theory says that land value is a derivative, an idea that goes back to David Ricardo's 1817 book *On the Principles of Political Economy, and Taxation*. A now classical elaboration of Ricardo's principle appears in Mills (1972, 40): "Land rent is a residual, equal to the excess of revenues from the sale of goods produced on the land over remunerations to non-land factors used in production."

Figure C9.2
Chinese Housing Market System Dynamics Model with Local Government Revenue-Maximizing Behavior

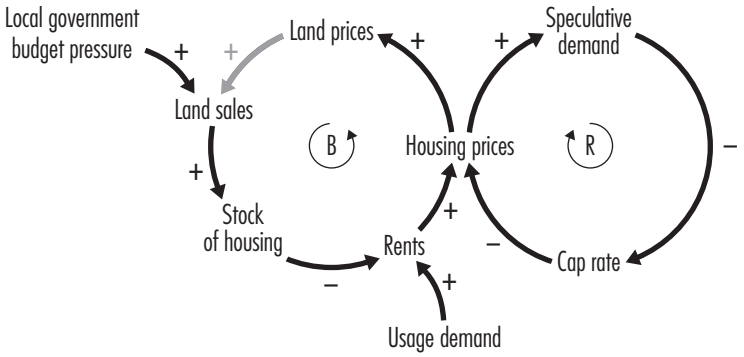
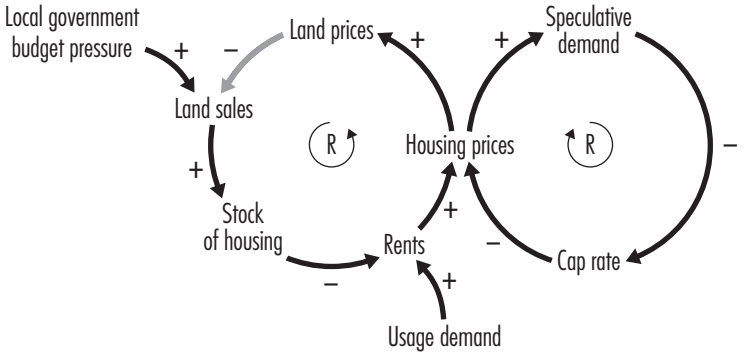


Figure C9.3
Chinese Housing Market System Dynamics Model with Local Government Fixed-Revenue Behavior

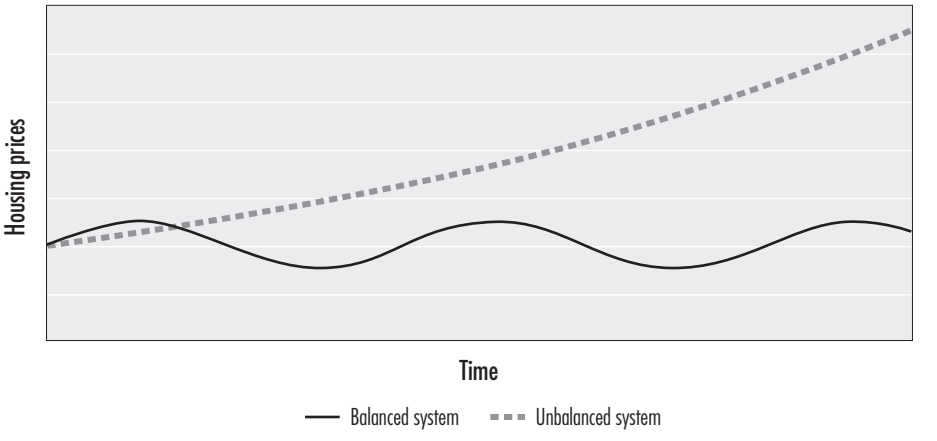


As shown in figure C9.2, when the local government is trying to maximize revenue, the system does not tend overly toward housing price bubbles. The housing market loop on the left acts as a balancing loop, which means that it tends to keep the system in balance, not spiraling out of control. The key point is that rising land prices lead the local government to sell more land. This leads to an increase in the supply of housing, which puts downward pressure on rents and/or housing prices. This in turn puts downward pressure on land prices, thereby counteracting or dampening the initial trigger—rising land prices.

When the local government is aiming at a fixed-revenue target, however, the relationship between land prices and land sales is more consistent with the type of result Man describes. Figure C9.3 shows the causal flow between land prices and land sales as a negative, rather than a positive, relationship. In SD terminology, this changes the main housing market loop on the left from balancing to reinforcing. An increase in land prices leads the local government to sell *less* land, which will be sufficient to meet the fixed-revenue target because of the higher price per acre. Thus, higher land prices lead to fewer land sales, which results in less stock of housing than would otherwise occur, in spite of rapidly growing housing demand (reinforced by speculation in the right-hand loop). The reduced (or less rapidly growing) housing supply drives up rents and prices, leading to higher land prices (again via the residual theory), and the loop continues in an upward spiral.

As shown in figure C9.4, these two different behaviors lead to dramatically different housing price dynamics, at least in theory. Revenue-maximizing behavior, in which higher land prices lead to more land sales to developers, results in a system that is fundamentally balanced, even if it may experience cycles that tend to revert to the mean over time. (Those cycles could be rather exaggerated, especially due to the reinforcing speculative demand loop.) Fixed-revenue behavior, in which higher land prices lead to fewer land sales, results in a system that tends to spiral out of control, with ever higher housing prices. (Once the bubble bursts, the same system dynamics would cause prices to collapse rapidly in a self-reinforcing manner.)

Figure C9.4
Housing Price Dynamics Resulting from Alternative Land Sales Behaviors



The SD model can thus be used to demonstrate how Man's hypothesis that land prices are driving housing prices could be true. But the model also suggests that local governments' land sales behavior is the key mechanism in the system. To create a more efficient and balanced housing market, land sales behavior needs to be more revenue maximizing—more like the behavior of a free market. Thus, the SD model, as compared with a classical economic or econometric model—in particular to handle nonmarket actors and idiosyncratic behaviors by key agents—can be used with great effect to reflect both exogenous influences and endogenous dynamics.

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Housing Policy

10

Housing Policies and Urban Development: Lessons from the Latin American Experience, 1960–2010

Eduardo Rojas

A house provides protection from the environment, privacy to its users, and access to urban services. In Latin America, not everyone has access to adequate housing, especially low-income households.[1] Traditionally, profit-seeking private real estate developers supplied houses for high- and middle-income households, with financing available from government-sponsored mortgage banks or savings and loans institutions. This system could not satisfy the housing needs of all the urban households whose numbers grew rapidly in the second half of the twentieth century. Households unable to find housing in the formal markets resorted to informal solutions by either invading land or purchasing illegally subdivided lots and building their houses incrementally. Today, the informal sector produces on average one out of every four houses added to the housing stock (two out of four in some cases), which is a significant contribution to the housing supply (Bouillon et al. 2012).

The welfare consequences of poor housing are linked directly to problems such as poor health and low educational achievement. Over the years, governments in Latin America have experimented with a variety of approaches to address the housing problem, ranging from expanding the housing supply through the

1. This study refers only to Latin America and does not include the English-speaking countries of the Caribbean, which have taken a different approach to housing.

direct provision of new houses to accepting informal settlements and incremental housing construction as legitimate ways of obtaining a home. Over the past three decades, some governments have provided direct subsidies to lower-income families wishing to save to buy a home by way of private mortgage financing.

While these housing policies have been effective in reducing the region's housing deficits, they have not sufficiently considered the housing sector's impact on urban development patterns. The evidence presented in this chapter suggests that formal and informal housing production and consumption have occurred in a weak urban development management framework with mostly uncoordinated and sector-focused institutional arrangements for the planning and implementation of network infrastructure, transportation services, and the provision of basic urban services and amenities.

In most Latin American countries, housing policy formulation and implementation occur quite independently of urban development policy and implementation. The most evident result of this state of affairs is that the activities of private developers, government housing institutions, and informal settlers have contributed to the acceleration of urban sprawl, without any concomitant interventions to prevent or mitigate its negative effects. Among the most significant impacts are the growing consumption of natural resources; increased pressure for public budgets to extend urban infrastructure and services; poor living conditions in new suburban subdivisions due to the lack of urban services and nearby employment; and limited access to urban centers due to lack of good roads and inadequate public transportation. Contrary to what housing policy advocates seek through the implementation of public housing programs, the overall effect of these conditions is a poorer quality of life for a significant proportion of urban households.

This chapter reviews the outcomes of the housing sector in Latin America over the past 50 years and the socioeconomic events and housing policies that have affected its performance. Due to limitations of information and space, the focus is on one aspect of the housing problem that is not well documented in the literature: the urban impacts of housing sector outcomes over the past 15 years. Further, the chapter suggests measures to prevent or alleviate the negative effects of the current housing situation.

Data on the housing policies and outcomes of 18 Latin American countries come from Cuenin et al. (2012) and Rojas and Medellin (2011). The analysis of the urban impacts of housing construction relies on data provided by Angel et al. (2011) for 15 cities and on more detailed data for four countries (Argentina, Chile, Colombia, and Mexico) in Rojas (2010a) and information from the websites of the countries' housing institutions.

The analysis of the data shows that government housing policies—a major determinant of housing outcomes—to a large extent have been designed with little or no consideration of their urban impacts and have been implemented with little regard for other policies and plans impacting urban development. They do not mitigate production biases of stakeholders operating in the formal housing sector that exacerbate urban sprawl and create poorly served housing subdivi-

sions that do not provide households with all the services that they require. New housing is generally the product of discrete, uncoordinated projects undertaken by a multitude of developers and national public housing institutions. Private developers find it more profitable to build new houses in the periphery of cities where land is cheap and public housing institutions do the same to save resources in the purchase of land and build more houses with their allocated budgets. The activities of informal land providers and incremental house builders add to these urban problems. There is an urgent need to closely link residential construction with urban development interventions so that new houses are located in compact, livable, and diverse neighborhoods that contribute to building better cities and not simply to fulfilling the objective of adding more houses to the stock.

This chapter is broken down into five main sections that discuss (1) the rapid urbanization process that has resulted in the housing problems in Latin America today; (2) the evolution of the housing sector and housing conditions in the region over the past 15 years; (3) the housing policies and programs that have influenced these conditions; (4) the urban impacts of the housing sector; and (5) arguments for reforming housing policies to improve the living conditions of the urban population.

Urbanization and Housing in Latin America

Latin America is the most urbanized developing region in the world. In 2011, 78 percent of the region's 600 million inhabitants lived in urban areas, compared with 72 percent of the population in Europe and 82 percent in North America, the most developed regions of the world. By contrast, only 39 percent of the population in Africa and 45 percent in Asia live in cities (UN 2012).[2] The urbanization process has been very rapid; Latin America reached Europe's current level of urbanization in 50 years, moving from 41 percent in 1950 to 75 percent in 2000, compared with the more than 150 years the process took in Europe. During that time, the region's cities incorporated 324 million inhabitants, 4.5 times the population they had in 1950 (70 million) (UN 2012).

HOUSING CONDITIONS AT THE TURN OF THE CENTURY

This rapid growth in population put a significant strain on the cities' capacity to provide housing and urban services. A house is a complex good whose production and consumption occur in several interrelated markets. Angel (2000, 14) writes that the housing market "is not a single, unfettered market—houses vary by location, quality, design, quantity, form of tenure, degree of legality, and

2. In compiling these statistics, the United Nations uses each country's definition of *urban*. Most of the countries in Latin America classify settlements of 2,000 or more as urban, some use 5,000, and a very few use 20,000.

neighborhood amenities. It is composed of a number of fragmented submarkets." Furthermore, these markets are affected by government regulations and interventions (Malpezzi 1999).

A dual structure of housing production and consumption exists in the housing sectors of Latin America's economies. On one hand, there is a formal housing market, with land developers and builders that abide by the land subdivision and building controls of the government and with households capable of buying the houses, either with savings or through long-term mortgage financing. By the mid-twentieth century, the formal housing sector provided finished and legally registered houses only for upper-income and a few middle-income residents, or about 40 percent of the population (Perry et al. 2006). This forced low-income households to find housing by squatting on land, acquiring illegally subdivided land to build houses incrementally, or doubling up with other households in informal settlements located on the urban periphery or in inner-city slums.

There are many stakeholders in the housing sector, including suppliers of building materials, land developers and builders, the government (which sets up housing regulations), and the households that purchase or rent homes. Some of these stakeholders operate formally (abiding by the government's subdivision, building, tax, sale, and rental rules) and others informally (not complying with one or more of the government's regulations). The key stakeholders in the formal and informal components of the housing sector are listed in table 10.1.

Toward the end of the twentieth century, the performance of the housing sector in Latin America was not very encouraging. According to information provided by Van der Rest and López (1980), in the late 1970s between 50 and 70 percent of the urban population could not afford to buy or rent finished and fully serviced houses offered by private stakeholders operating in the formal sector. Therefore, this population resorted to the housing solutions provided by the informal sector. The situation a decade later did not show much improvement. Angel (2000) reports that in 1990, 27 percent of the housing stock was "unauthorized housing" and 25 percent was "squatter housing," both in the informal sector. Information for some countries indicates that around 2007, the informal sector was still providing 37 percent of the new housing stock in Argentina, 56 percent in Colombia, and 30 percent in Mexico (see table 10.4 later in the chapter). To a great extent, the high incidence of poverty among the urban population and the underdevelopment of housing finance mechanisms explain these outcomes.

RECENT TRENDS IMPACTING URBAN DEVELOPMENT AND HOUSING

Toward the end of the first decade of the twenty-first century, housing conditions in Latin America showed some improvement. This was the result of both a reduction in poverty and government housing policies and programs.

Notwithstanding the slow increase in per capita income and its unequal distribution over the past thirty years, Latin America has made significant progress in reducing poverty and incorporating a significant number of households into

Table 10.1
Key Stakeholders in the Housing Sector

Stakeholder	Characteristics and Activities
Formal Stakeholders	
Landowners	Provide land for residential development
Land developers	Subdivide land for housing
Public utility companies	Supply basic infrastructure: water, sanitation, etc.
Government entities (local, regional, and national)	Provide roads, drainage, waste collection and disposal, and urban healthcare, education, and recreation services
Home builders	Build houses for sale on the market
Real estate financing institutions	Provide mortgage loans for home buyers
Home buyers	Purchase houses with savings and mortgage loans
Home renters	Rent formally built and managed residences
Public housing institutions	Build, distribute, and finance finished homes and residential lots as part of the government's housing policies and programs
Informal Stakeholders	
Squatters	Squat on public or private land to secure a residential plot
Illegal land sellers	Subdivide land for sale outside the government's subdivision regulations
Illegal land buyers	Purchase illegally subdivided land for residential use
Self-builders	Build and improve their homes on legal or illegal land
Renters of space in informal housing	Rent residential space in houses built in informal settlements
People doubling up	Live in friends' or relatives' households in informal settlements

the middle class. ECLAC (2014) reports that in 2012 28.2 percent of the population was poor, down from 48.4 percent in 1990. Extreme poverty affected 11.3 percent of the population, a substantial decrease from 22.6 percent in 1990. One of the consequences of the increase in per capita income and the reduction of unequal distribution of income has been the growth of the population falling in the middle-income bracket of the income distribution structure. According to the World Bank (2013, 5), "In 2011, for the first time in recorded history, the Latin American region had more people in the middle class than in poverty. The threshold for the middle class of $10 [US$] a day per capita reflects a level of income at which the probability of falling back into poverty is less than 10 per cent. . . . Faster and more equitable income growth helped expand the middle

class to 32 per cent of the region's total population in 2011. For the first time, this grouping surpassed the poor, who numbered 27 per cent based on the $4 [US$] a day moderate poverty line."[3]

The World Bank (2013) reports that from 1995 to 2009, the middle class—households earning between US$10 and US$50 per day (purchasing power parity)—increased by 50 percent and represented a population of about 160 million (27 percent of the total population). The number of nonpoor but still vulnerable (earning between US$4 and US$10 per day) grew steadily, reaching approximately 220 million, or 38 percent of the population. The number of people with incomes below the US$4 poverty line decreased to 165 million, or 28 percent (Ferreira et al. 2013).

The urban consequences of the greater purchasing power of the emerging middle class and nonpoor low-income population are significant. Middle-income households demand larger houses and more and better services. They aspire to have more access to personal motorized transportation, thus consuming more energy and using the urban road network more intensively. The higher income of the nonpoor low-income population enables them to consume more goods and services, the majority of which are provided by the city. As discussed later in this chapter, with appropriate policies the government could channel the growing purchasing power of middle-income and nonpoor low-income households to partially pay for improving their housing situations and thereby lessen the government's burden of providing them with adequate housing.

Urbanization has been accompanied by changes in the structure and dynamics of the population. The most significant change has been that in spite of a steady decline in the annual population growth rates—from over 2 percent in the 1950s to just above 1 percent in the 2010s—there is a growing demand for houses due to growing rates of household formation. In urban areas, it is expected that the population will grow at a slower rate over the next 40 years, having reached a turning point in 2000–2005, when for the first time there were fewer new urban residents (36 million) than in the previous five-year period (41 million) (UN 2012). Very significant for the housing sector is the steady decline in average household size, which is expected to fall from 3.52 persons in 2010 to 2.78 persons in 2030. Rojas and Medellin (2011) estimated that the total number of urban households will increase from 130 million in 2010 to 190 million in 2030 and 230 million in 2050. This growth will translate into a demand for

3. The World Bank (2013) defines the middle class based on economic security, or the low probability of falling into poverty. This approach leads to the identification of a class between the low and middle classes, called the vulnerable due to the higher probability that its members will fall into poverty. Therefore, the four economic classes are (1) the poor (per capita income below US$4 per day); (2) the vulnerable (income of US$4–10 per day); (3) the middle class (income of US$10–50 per day); and (4) the high class (income of more than US$50 per day), all in 2005 purchasing power parity. The high-income class represents less that 3 percent of the population in Latin America.

approximately 3 million new homes each year over the next 20 years, a total of 60 million new homes needed.

Another significant demographic trend involves two changes in the structure of the population: the entry into the workforce of the large cohorts born in the 1980s and 1990s, and the reduction in the birthrate that occurred in later cohorts. These changes represent an economic development advantage commonly called a *demographic dividend* and a future economic burden for households and the government. The combination of the larger number of working-age members of households and the smaller number of dependents enables people to create and accumulate more wealth. This, among other advantages, should facilitate their access to formal housing and housing-related services. Over time, the demographic dividend will disappear as the workforce decreases in size and the dependency ratio increases due to an aging population (OECD 2014).

Housing Sector Outcomes and Housing Conditions

The outcomes of housing sector activity on the economy and its impact on the housing conditions of the population can be studied from different perspectives.[4] The economic perspective emphasizes the role of home ownership in households' accumulation of wealth and the impacts of housing construction on the economy. The focus on housing conditions explores the services provided by a house to its occupants, in particular those that are significant from a public policy point of view. The second perspective guides the analysis that follows.

HOUSING SHORTAGES: A SERVICES PERSPECTIVE

This analysis looks at the lack of housing services experienced by households, namely the quantitative and qualitative housing shortages (table 10.2).[5] Measuring the quantitative shortages offers insight into the capacity of the housing sector to provide adequate houses for all households. Measuring the qualitative

4. The housing sector outcome estimates used in this study are updates of the estimates provided by Rojas and Medellin (2011). The data set and methodology used here are the same as those described in that work.

5. The definitions used for this analysis focus on the essential services provided by a house. The lack of one or more of these services constitutes a shortage. Households that unwillingly share a shelter (typically more than two households living under the same roof but not sharing food expenses) are considered to be facing a *quantitative* housing shortage. Also included in this type of shortage are households living in shelters that cannot be upgraded given the poor quality of the building materials. Any household deprived of at least one essential service is considered to be facing a *qualitative* shortage: protection from the environment, access to potable water, and the sanitary disposal of waste products. Households also need to be able to satisfy their physiological need for privacy; thus, overcrowded homes (more than three occupants per room) are considered inadequate. Households need the continuous supply of these services; thus, those with insecure tenure are considered to be facing a shortage as well.

Table 10.2
Definitions of Housing Shortages

Type of Shortage	Origin of Shortage	Category	Definition
Quantitative	Lack of shelter	Quantitative	Households doubling up with other households (excluding the principal household) Households living in non-upgradable shelters
Qualitative (excluding households affected by quantitative shortages)	Shelter conditions	Poor-quality building materials and overcrowding	Roof made of nonpermanent materials Walls made of nonpermanent materials Dirt floors Overcrowding: more than three persons per room
	Neighborhood conditions	Lack of infrastructure	Lack of piped potable water Lack of sanitary disposal of waste products Lack of electricity
	Tenure status	Lack of secure tenure	Insecure tenure on the house or land

Source: Rojas and Medellin (2011).

shortage offers insight into the capacity of the housing sector to provide all households with houses that supply all the basic services they require. Security of tenure relates to the assurances that households have of receiving the flow of services provided by the house on a continuous basis, that is, that they are not threatened with eviction or dispossession of their houses.

It is useful to analyze the various shortages independently given that their solution requires different combinations of household expenditures and activities, and government policies, programs, and investments. For instance, the solution to the quantitative and qualitative shortages of adequate building materials and overcrowding rests mostly on the household's capacity to save money to pay for a new house or to expand and improve the quality of an existing house; the solution to the shortage of infrastructure rests on the capacity of the public sector to provide potable water, sanitation, drainage, and electricity; and the solution to insecure tenure rests on regulatory measures passed and enforced mostly by the central government.

HOUSING OUTCOMES, 1995–2009

Housing conditions in urban areas improved between 1995 and 2009, as shown in table 10.3. The proportion of urban households facing housing shortages decreased for all shortages except security of tenure. Quantitative shortages dropped slightly, from 8 percent in 1995 to 6 percent in 2009, when approximately

Table 10.3
Urban Households Facing Housing Shortages, 1995, 2000, and 2009

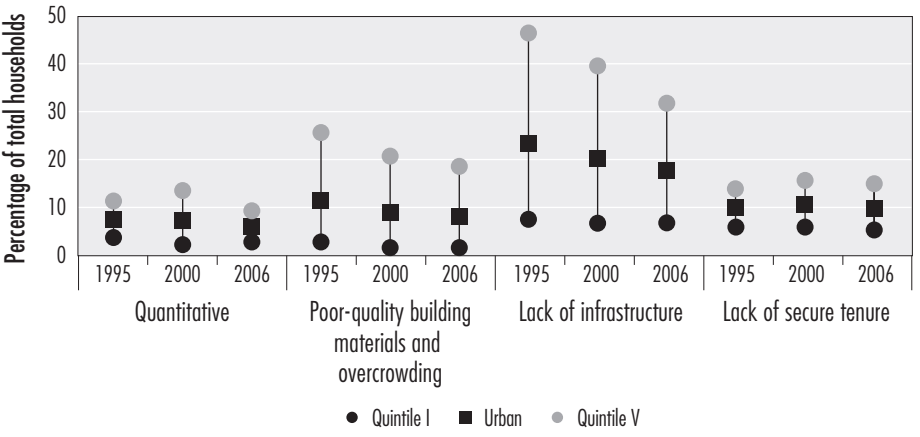
	1995		2000		2009	
	Percentage of Total Households	Number of Households (millions)	Percentage of Total Households	Number of Households (millions)	Percentage of Total Households	Number of Households (millions)
Quantitative	8	6.0	7	6.6	6	7.3
Qualitative						
Poor-quality building materials and overcrowding	12	9.0	8	7.9	7	8.6
Lack of infrastructure	24	18.4	20	19.2	16	20.2
Lack of secure tenure	10	7.7	11	10.3	11	13.4

Source: Author update of Rojas and Medellin (2011).

7.3 million households were sharing dwellings with others or living in shelters that could not be improved. Qualitative shortages declined significantly, particularly infrastructure shortages, which dropped from affecting 24 percent of households in 1995 to affecting 16 percent (20.2 million households) in 2009. Nevertheless, this is still the biggest housing challenge facing Latin American households. The incidence of poor-quality building materials and overcrowding also declined, from 12 percent to 7 percent (8.6 million households). The only shortage that did not improve was security of tenure, which increased from 10 percent to 11 percent (13.4 million households). As shown in figure 10.1, the gap in housing shortages between the poorest and the richest households, though still wide, narrowed between 1995 and 2006. For instance, in 1995 the difference in the percentage of households facing infrastructure shortages was 39 percent, while in 2006 it was 26 percent. A similar trend occurred for the other shortages.

Notwithstanding the improvements, Latin America is still far from being able to solve the quantitative deficits resulting from the rapid urbanization that has occurred since the 1960s. Practically speaking, the production and financing shortcomings of the formal housing sector are compensated for by activity in the informal sector. Data compiled by Rojas et al. (2010) on the actors contributing to the housing stock in Argentina, Chile, and Colombia in 2007 reveal that out of the total number of new houses added, the contribution of the informal sector was dominant in Colombia (producing 56 percent of all new houses), significant in Argentina (37 percent), and nonexistent (according to central government

Figure 10.1
Gap in Housing Shortages Between the Poorest and Richest Households, 1995–2006



Source: Rojas and Medellin (2011, 10, fig. 3).

Table 10.4
New House Production by Submarket in Argentina, Chile, Colombia, and Mexico (%)

Stakeholder	Argentina (2007)	Chile (2007)	Colombia (2007)	Mexico (2013)
Formal sector				
Private developers	42	48	24	6
Government-supported programs	21	52	19	64
Informal sector	37	0[a]	56	30

[a]According to official statistics.
Sources: Rojas et al. (2010, 70, table 14) for Argentina, Chile, and Colombia; author calculations based on data from CIDOC (2012) for Mexico.

statistics) in Chile (table 10.4).[6] Data for Mexico suggest that in 2010 the informal sector accounted for at least 30 percent of the new housing stock (CIDOC 2012).

Note that government-supported programs were responsible for financing or building 64 percent of the new houses in Mexico and 52 percent of them in Chile. These figures are more than double the government-supported segment in Argentina (21 percent) and Colombia (19 percent). Without public support, the private sector produced 48 percent of the new houses in Chile, 42 percent in Argentina, 24 percent in Colombia, and only 6 percent in Mexico.

Table 10.5 displays significant variations in Latin American countries' housing problems for the years 2000 and 2009, suggesting that there is no one-size-fits-all solution to urban housing problems in the region. Rather, each government should base its interventions on detailed and well-documented diagnoses of the country's specific housing situation.

Gilbert (2003) reports that in the late 1990s, 69 percent of urban households throughout Latin America owned their homes and only 20 percent rented. The proportion of renters was just over 38 percent in Colombia and only 6 percent in Nicaragua.[7] Latin America is essentially a region of homeowners, a situation in sharp contrast to other regions of the world, where renting is more common.[8] The predominance of owner-occupied housing in Latin America constitutes a

6. Irarrázabal (2013) reports that 1 percent of the Chilean population lives in informal settlements.

7. These percentages change slowly, possibly as a result of long-term social and economic trends, and the long-term impacts of housing policies.

8. The United Nations reports that in the late 1990s, the percentage of households that rented was much higher in some OECD member countries than in Latin American countries: 60 percent of households in Germany, 50 percent in Austria, 47 percent in the Netherlands, 39 percent in Sweden, and 34 percent in the United States (UN-Habitat 2003).

Table 10.5
Housing Shortages by Income Level Across Latin America, 2000 and 2009 (percentage of total housing stock)

		Quantitative		Poor-Quality Building Materials and Overcrowding		Lack of Infrastructure		Lack of Secure Tenure	
		2000	2009	2000	2009	2000	2009	2000	2009
High income	Chile (CHL)	5	3	2	1	4	2	13	14
	Mexico (MEX)	2	2	10	9	11	8	14	15
	Argentina (ARG)	3	4	11	9	16	10	13	16
	Uruguay (URY)	2	0	3	3	3	8	14	22
	Panama (PAN)	10	8	9	6	24	21	17	15
	Venezuela (VEN)	6	7	6	13	11	7	8	7
Upper middle income	Costa Rica (CRI)	2	2	8	5	4	1	7	6
	Brazil (BRA)	8	6	3	1	28	23	8	7
	Colombia (COL)	11	8	7	7	8	9	9	10
Lower middle income	Peru (PER)	15	13	33	31	30	22	22	25
	Dominican Republic (DOM)	11	3	7	5	35	25	11	9
	Ecuador (ECU)	12	10	23	14	25	19	12	13
Low income	El Salvador (SLV)	6	7	26	21	32	30	15	16
	Paraguay (PRY)	6	6	17	12	35	20	9	12
	Guatemala (GTM)	12	11	39	32	36	32	12	10
	Bolivia (BOL)	27	30	29	27	38	32	13	11
	Honduras (HND)	3	2	26	16	35	20	14	11
	Nicaragua (NIC)	13	7	42	31	63	53	12	8

Note: The countries are arranged in descending order of GDP per capita (2009 purchasing power parity).
Source: Author update of Rojas and Medellin (2011).

problem as it reduces households' mobility (if they feel they may lose their houses if they rent them to others).[9] A well-functioning housing market needs a substantial supply of rental units for all income levels in order to cater to the needs of households in different stages of the family life cycle, to those who are changing jobs or cities of residence, or to those who cannot afford or do not want to buy a house. According to Gilbert (2003), the high percentage of owner-occupied dwellings in this region can be attributed to the number of housing policies that promote home ownership, mostly through government-sponsored programs, as well as the policies that limit the development of rental markets by protecting tenants and imposing rent controls.

SECTOR AND URBAN FACTORS IMPACTING HOUSING OUTCOMES

Income is arguably the main constraint on the ability of households to buy a finished home, but access to credit and the prices of houses play determinant roles as well. This combination of factors is measured by the "affordability" of housing. Bouillon et al. (2012) calculated this indicator for 41 Latin American cities. They concluded that on average 57 percent of the households could afford to pay a mortgage that would allow them to buy the lowest-priced dwelling offered by the private sector (provided there were enough dwellings available at that price and the financial institutions were willing to lend). The affordability level varies considerably across cities. For example, in the city with the highest affordability—San Jose, Costa Rica—74 percent of the households could afford to buy the lowest-priced house, while in Caracas, Venezuela, only 21 percent could afford that house.[10]

The cross-country analysis of the housing shortages in Latin America by Rojas and Medellin (2011) shows that there is a strong negative relationship between per capita income and percentage of households facing housing problems. This relationship holds for all types of shortages except lack of secure tenure. The higher the per capita income of a country is, the better the general housing conditions of the population. The relationship is particularly strong for shortages related to poor-quality building materials and lack of infrastructure. Given this relationship, increases in per capita income could be expected to result in improvements in housing conditions. Using the same rationale, the housing situation

9. Such a situation may arise where there is little enforcement of rental contracts, where laws favor tenants, or where beneficiaries of government housing programs are prevented from renting out their subsidized houses.

10. The factors that hamper affordability vary considerably among cities. The high price of formally produced houses is the main affordability constraint in Buenos Aires, São Paulo, Santiago, Montevideo, and Caracas, counteracting the positive effects of the relatively high average household incomes of these cities. Conversely, low housing prices improve affordability in cities with lower average household incomes, including La Paz, Recife, Managua, Guayaquil (Ecuador), and Bogotá (Colombia).

of a particular country should correspond to its per capita income, but this is not always the case. Figure 10.2 shows that some countries with a relatively high per capita income have larger qualitative or quantitative housing shortages than some countries with a lower per capita income. Based on this finding, it could be argued that the housing sectors of countries with housing conditions above the prediction line are doing worse than their income level would suggest, and those with housing conditions below the prediction line are doing better. For instance, the housing shortages related to building materials and access to infrastructure in Costa Rica, Colombia, Honduras, Paraguay, and Uruguay are better than what would be expected given the per capita income in those countries. It is also remarkable that Brazil, Argentina, Panama, and Mexico—all with a relatively high per capita income—have a greater percentage of dwellings lacking infrastructure than would be expected. This observation led Rojas et al. (2010) to assert that housing policy is a determining factor in housing sector outcomes.

The availability of low-cost, serviced land for residential use is critical for the supply of housing at prices accessible to the low-income population. The cost of land is strongly affected by local factors, including the availability of developable raw land; the availability of trunk infrastructure; the volume of urban land demanded in the city; and the structure of land ownership, land taxation, and land use regulations. Given the mostly local nature of land issues, the analysis presented here focused on the capital cities of three of the four countries studied in detail: Buenos Aires, Santiago, and Bogotá. Table 10.6 presents data on the price of raw land outside these cities (that is, rural land without infrastructure and not officially designated for urban uses by land use regulations) and the price of serviced land on the urban periphery. Also presented is the price of the lowest-priced dwelling sold by the private sector and the average income of households in the lowest quintile of the income distribution. This information was used to calculate the land conversion multiplier[11] and indicators related to the affordability of serviced land for low-income households based on the price of the minimum-size lot legally allowed in the city.[12]

The land conversion multipliers for the three cities in the late 2000s are highly related to those reported by Angel for the 1990s (Angel 2000), indicating that land markets continue to place a high premium on serviced land—or, from a different perspective, that it is expensive (and perhaps not easy) to develop land legally in these cities. The cost of the minimum-size serviced lot for residential use would consume 1.22 times the annual median income in Buenos Aires,

11. The land conversion multiplier measures the increase in the land price resulting from its conversion to urban uses (that is, the change in land use status and the provision of infrastructure that allow the legal subdivision of the land into residential lots).

12. The total cost of the minimum-size lot is calculated on the basis of the cost of serviced land and the minimum size required for a lot to be legally registered as a residential lot in the city.

Figure 10.2
Per Capita Income and Housing Shortages by Country, 2009

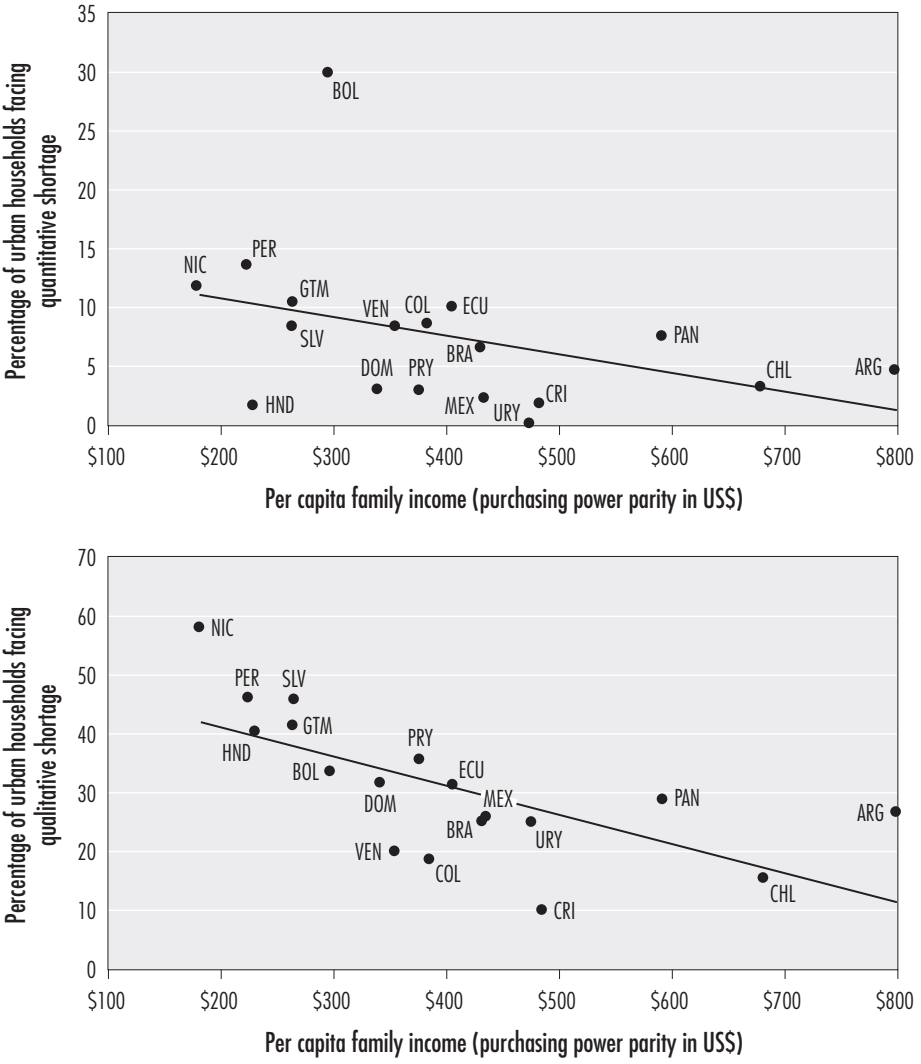


Table 10.6
Selected Indicators of Land Markets in Buenos Aires (2011), Bogotá (2007), and Santiago (2010)

Indicator	Buenos Aires	Santiago	Bogotá
Price of rural land (US$ per square meter)	1.5	5.8	2.4
Price of serviced land on urban periphery (US$ per square meter)	36	80	76
Land conversion multiplier	24	14	32
Minimum-size serviced lot (square meters)	300	120	35
Minimum lot price (US$)	10,800	9,600	2,660
Annual median income (US$)	8,853	11,712	4,045
Lowest-quintile mean income (US$)	1,573	2,669	1,249
Ratio of price to median income	1.22	0.82	0.66
Ratio of price to lowest quintile mean income	6.86	3.60	2.13
Lowest-priced dwelling (US$)	40,000	28,000	17,500
Land as a percentage of the selling price of the lowest-priced dwelling	27	34	15

Sources: Author calculations based on Casazza et al. (2011) for Buenos Aires; Trivelli (2010) for Santiago; and Garza (2007) for Bogotá.

0.82 times the income in Santiago, and 0.66 times the income in Bogotá.[13] The situation is worse for the low-income population. The price of a minimum lot would consume 6.86 times the annual median income of the lowest-quintile households in Buenos Aires, 3.6 times the income in Santiago, and 2.13 times the income in Bogotá. These ratios are within the range reported by Angel (2000) for cities in countries with a similar per capita income. They highlight the unaffordability of legally subdivided land for low-income populations and also call into question the large minimum lot size in Buenos Aires, a situation that also exists in other cities.

The price of serviced land is a major component of the change in housing prices. As table 10.6 shows, the price of land represents around 30 percent of the cost of the lowest-priced dwelling in Buenos Aires and Santiago, and 15 percent of the cost in Bogotá (mostly due to the small minimum lot size). Efforts to make housing more affordable to households at all income levels must include,

13. The low price-to-income ratio in Bogotá is highly dependent on the small minimum size of a legal residential lot (35 square meters). If the minimum size in Bogotá were the same as in Santiago (120 square meters), the cost would consume 1.9 times the median income, and if it were the same as in Buenos Aires (300 square meters), it would consume 5.6 times the median income. These ratios are greater than the ratios for cities with a similar per capita income, underscoring the fact that residential land is also expensive in Bogotá.

out of necessity, urban land management policies that favor the production and sale of serviced residential lots at prices compatible with the purchasing capacity of households and the ability of governments to support households in need of housing.

Another factor related to the modest performance of the housing sector in Latin America is the underdevelopment of the housing finance system. The relative size of the mortgage portfolio of Panama (in 2005 the largest portfolio in relation to GDP, 27.7 percent) is just a little more than half the size of the average portfolio of the 15 countries that initially formed the European Union (48.9 percent) and well below the average in the United Kingdom (80 percent) and the United States (71.2 percent) (Cohen et al. 2007). In addition, Badev et al. (2014) estimate that Latin America is well below the optimal mortgage market in depth and penetration, using the level of social, economic, and institutional development as a benchmark.[14] According to Cohen et al. (2007), this lack of development is the result of persistently high and poorly mitigated credit and collateral risk, along with the incidence of significant term-mismatch risk in Latin America's housing finance systems, all of which counteract the reduction in interest rate risk attained in the past two decades as a result of the region's sustained macroeconomic stability and control of inflation (Rojas 2004).

Housing Policies and Programs

During the 1960s, the poor housing conditions in the rapidly growing cities of Latin America prompted the concern of governments, which began to implement policies and introduce reforms to improve the performance of the housing sector and assist low-income households in accessing housing. Today, in most countries the housing sector is the target of significant public interventions, a fact that also helps explain many of the housing sector outcomes discussed in this chapter.

A TYPOLOGY OF POLICIES

Almost all governments in Latin America consider the housing sector to be a critical area of public policy with vast social and economic impacts.[15] Governments also use public expenditures on housing as a means to jump-start stalled economies. There are ethical and ideological arguments for intervening in the

14. The benchmark is based on "certain state variables that cannot be changed in the short term and that include both the structural variables [macroeconomic environment, institutional development, market size, and demographic factors] . . . as well as long-term institutional factors" (Badev et al. 2014, 21).

15. Housing is commonly considered a merit good, prompting some governments to assume the responsibility to ensure that people have access to a minimum level of housing services. This approach is grounded in the premise that good housing is necessary for individuals to realize their full potential, as it affects health, safety, and education, among other important public goods.

Table 10.7
Constitutional Provisions Concerning Housing

Constitutional Provision	All Persons Have the Right to Live in Adequate Housing		Housing Is a Merit Good	No Mention of Housing
Government commitments	The government will provide social benefits, including housing. The government will guarantee access to decent and proper house for all.	The government will promote social housing programs through adequate financing mechanisms, with a focus on low-income, rural, and vulnerable households.	The government will facilitate the construction of houses and the development of financing mechanisms accessible to the largest possible proportion of households, with priority given to low-income households.	
Countries committed	Argentina Ecuador	Bolivia Brazil Colombia Costa Rica Dominican Republic Guatemala Honduras Mexico Nicaragua Paraguay Peru	El Salvador Panama Uruguay	Chile

Source: Bouillon (2012, 240, table 9.1).

housing sector as well. Cuenin et al. (2012) report that the constitutions of thirteen of seventeen countries surveyed in this study state that all people have the right to live in adequate housing, and another four state that housing is a merit good (table 10.7).[16] The countries have experimented with a vast array of housing policies and programs, ranging from the direct production of houses through

16. The constitutions declaring housing as a right emphasize one of two means of attaining this objective: (1) the government must "guarantee" access to a decent and proper house (*vivienda digna*) for all (Argentina and Ecuador); or (2) the government must "promote" housing programs for low-income and vulnerable households (the rest of the countries). The constitutions conceiving housing as a merit good say that the government needs only to "facilitate" the construction and financing of housing accessible to people at all income levels.

public institutions to the implementation of reforms that facilitate the functioning of the housing markets (also known as the "enabling markets" approach).

The housing programs studied in Cuenin et al. (2012) can be separated according to whether they involved the direct intervention of the government in the provision of housing or were more "pro-market," focusing on facilitating the functioning of key aspects of the housing market (the supply of serviced residential land, provision of housing finance, and the functioning of the building industry). Table 10.8 summarizes this analysis, listing the public housing programs according to their level of government intervention.

The left side of the table includes the programs that involve the most direct forms of government intervention to compensate for the formal housing sector's shortcomings in providing minimum housing for all. These interventions include the direct construction and financing of housing by public institutions and the provision of subsidized financing by public entities using workers' retirement savings. The beneficiaries of these programs—usually a minority of those in need due to budgetary and savings constraints—receive heavily subsidized houses.

In the center of the table are the government programs that provide subsidized financing to middle- and low-income households, mostly through public institutions funded with workers' retirement savings.

On the right side of the table are the pro-market programs that attempt to promote private sector involvement in housing production and finance through housing market reforms and targeted interventions. These programs seek to leverage beneficiaries' resources in order to expand housing production and better direct public resources to very low income households. Pro-market programs usually involve a more limited commitment on the part of the government in regard to housing finance. This approach was pioneered by Chile in 1976 and Costa Rica shortly thereafter. The United Nations advocated it in the late 1980s (UN-Habitat 1989), and it was later adopted as a policy by the World Bank (World Bank 1993) and the Inter-American Development Bank (IDB 1995).[17]

17. Two efficiency considerations underlie the promotion of this approach by international organizations. The first relates to the need to reduce the burden taken on by governments in the direct supply and financing of houses. Financing mortgages with public resources or workers' savings, though expedient in the short term, generates long-term liabilities for the government, which must continue supplying liquidity to the lending mechanism or be required to pay for the shortfall in funding when workers are ready to tap their savings for retirement. The second consideration is the convenience of attracting to the housing sector resources from the private finance sector to expand the volume of resources flowing to the housing sector of the economy. Competitive mortgage lending in a secure transaction environment will attract long-term savings to fund loans, affordable payment terms will keep defaults low, and a well-financed demand should attract investors to expand supply. All these developments will contribute to the long-term sustainability of housing production and consumption. Furthermore, expanding the range of households participating in the market will contribute to expanding the proportion of the population served by the private sector, liberating the resources of the public sector to assist the poor, who cannot access private financing.

Table 10.8
Public Housing Programs in Latin America by Type, 2010

Approach	Government Guarantees Access to Good Housing											Government Facilitates Operation of Housing Markets
Type of Program	Direct Public Interventions and Pro-market Interventions											
Country	Government Provision of Finished Houses	Government Provision of Incremental Houses	Government Provision of Serviced Land for Residential Use	Government Subsidies and Financing for Affordable Houses	Government Provision of Subsidized Housing Finance	Settlement Upgrading and Tenure Regularization	Housing Upgrading	Housing Vouchers	Government Financing of Incremental Houses	Regulations to Facilitate Subdivision of Land for Residential Use	Interventions to Expand Private Housing Finance
Argentina	X			X	X	X	X				
Bolivia	X				X			X			
Brazil	X				X	X		X			X
Chile	X	X				X	X	X			
Colombia			X		X	X		X			X
Costa Rica							X	X			X
Dominican Republic		X	X					X		X	
Ecuador						X	X	X	X		
El Salvador						X		X		X	X
Guatemala							X	X	X		
Honduras						X	X	X			X
Mexico		X		X	X	X	X	X		X	X
Nicaragua								X	X		
Panama					X	X	X	X	X		X
Paraguay											
Peru		X			X	X		X		X	X
Uruguay		X			X	X	X	X		X	X

Source: Author update of table 9.3 in Cuenin et al. (2012).

A REVIEW OF HOUSING PROGRAMS IN ARGENTINA, CHILE, COLOMBIA, AND MEXICO

This section explores some of the characteristics of housing programs in Argentina, Chile, Colombia, and Mexico. These countries have a long-standing commitment to improving housing conditions; are relatively rich by regional and worldwide standards; and have for many years and through various stages of their development maintained a strong and constant interest in the housing sector, devoting significant public resources to housing and developing dedicated institutions to intervene where necessary. The four countries have different approaches to housing policy—three (Chile, Colombia, and Mexico) emphasizing programs that support the demand for housing, and the fourth (Argentina) showing a preference for programs that support the supply of houses.

The tables in the Appendix identify the government housing programs in each of these countries in 2014. Table 10.9 lists the programs according to the housing policy approach, distinguishing between those that entail more direct government involvement and those that are more pro-market. In regard to the territorial scope of the programs, some individual households, and others are area focused, supplying neighborhood services to groups of households.

Programs Benefiting Individual Households Government interventions in housing that benefit individual households range from supply-oriented programs that direct provision of finished houses by the government to eligible beneficiaries, such as Argentina's Programas Federales (Federal Housing Programs), to demand-oriented programs that facilitate access to housing finance for low-middle- and middle-income households, such as the subsidies provided by Chile's Compra tu Vivienda (Buy Your House) program. The second group of programs also includes those fostering the development of housing finance markets, such as Mexico's second-tier mortgage finance facility run by the Sociedad Hipotecaria Federal, or SHF (Federal Mortgage Society), and Colombia's program to promote household savings, Vivienda para Ahorradores (Housing for Savers).

In terms of their objectives, all of these programs focus on the provision of a formal housing solution to households in need. They differ, however, in their means of achieving that objective. In the supply-oriented approach, the objective is achieved through the direct action of public agencies that build and distribute housing solutions. In the demand-oriented approach, private for-profit developers provide the houses, and individual households choose the ones they want to purchase with public support.

In Argentina, housing programs tend to rely on the direct intervention of the government, while in Mexico they rely more on the private sector, with the government supporting demand through subsidized loans. The programs in Chile and Colombia are more widely distributed across the spectrum presented in table 10.9. These countries have programs in which the government is directly involved in supplying or fully financing affordable houses for low-income households like

Table 10.9
Public Housing Programs in Argentina, Chile, Colombia, and Mexico by Type, 2014

Approach	Government Guarantees Access to Good Housing											Government Facilitates Operation of Housing Markets
Type of Program	Direct Public Interventions and Pro-market Interventions											
Country	Government Provision of Finished Houses	Government Provision of Incremental Houses	Government Provision of Serviced Land for Residential Use	Government Subsidies and Financing for Affordable Houses	Government Provision of Subsidized Housing Finance	Settlement Upgrading and Tenure Regularization	Housing Upgrading	Housing Vouchers	Government Financing for Incremental Houses	Regulations to Facilitate Subdivision of Land for Residential Use	Interventions to Expand Private Housing Finance
Argentina	Programas Federales			FONAVI	PROCREAR	PROMEBA PROMHIB	Mejor Vivir				
Chile		Compra tu Vivienda, Section I				Mejorar tu Barrio, Sections I, II, III, and IV	Mejorar tu Vivienda, Sections I, II, and III	Compra tu Vivienda, Sections II, III, and V			
Colombia	Vivienda Gratuita		Macroproyectos		Subsidized mortgages	Mejoramiento Integral de Barrios		Vivienda para Ahorradores			Ahorro Programado
Mexico				Esta Es Tu Casa FONHAPO	FOVISSTE INFONAVIT ISSFAM	HABITAT Espacios Públicos Rehabilitación de Conjuntos Habitacionales Desarrollos Certificados	Vivienda Digna FONAGAVIP		Vivienda Digna FONAGAVIP		Sociedad Hipotecaria Federal (SHF)

See text for translations of program names.
Sources: Data from SEDATU (2014) and CONAVI (2014).

Colombia's Vivienda Gratuita (Free Housing) and Chile's Compra tu Vivienda, Section I, and programs that support the demand for houses produced by the private sector like Colombia's Vivienda para Ahorradores and Chile's Compra tu Vivienda, Sections II, III, and IV.

The programs also have different beneficiaries. Some respond to the inability of very low-income households to pay for a house, and others respond to the barriers encountered by low-middle- and middle-income households to access private sector mortgages to purchase a finished home (new or old). The latter programs supplement household savings in order to reduce the size of the loan needed to finance a home, thereby enabling families to qualify for a mortgage supplied by private banks. One example is Compra tu Vivienda, Section III, in Chile and Vivienda para Ahorradores in Colombia. Chile also has a program that helps middle-income households build a house on their own lot (Compra tu Vivienda, Section V). A significant portion of the loans issued by Mexico's FOVISSTE (Housing Fund of the Public Servants' Social Services and Social Security Institute), INFONAVIT (Workers' National Housing Fund Institute), and ISSFAM (Mexican Armed Forces Social Services Institute) benefit middle- or low-middle-income households with subsidized interest rates and access to several complementary loans to pay for a house produced by a private developer. Argentina's PROCREAR program serves the same purpose.

To address qualitative housing deficits, which in some countries are numerically and proportionally larger than quantitative deficits, there are programs to assist households in improving their current home, such as Mejorar tu Vivienda (Improve Your House) in Chile and Mejor Vivir (Better Living) in Argentina. As shown in table 10.8, Costa Rica, Ecuador, Guatemala, Honduras, Panama, and Uruguay also have this type of program.

Area-Focused Programs Area-focused programs benefit groups of households by improving the quality of urban services. Neighborhood improvement programs such as PROMEBA and PROMIHB in Argentina, Programa Integral de Mejoramiento de Barrios (Integrated Neighborhood Improvement Program) in Colombia, Mejorar tu Barrio (Improve Your Neighborhood) in Chile, and HABITAT and Rehabilitación de Conjuntos Habitacionales (Rehabilitation of Housing States) in Mexico are responses to the large qualitative shortages documented by Rojas and Medellin (2011). Area-focused programs target individual settlements—most commonly substandard squatter settlements and illegal subdivisions inhabited by low-income households—and do not contribute to improving the living conditions of formal urban neighborhoods that also may have similar infrastructure and urban services deficits (Couriel 2010). An exception is Chile's Mejorar tu Barrio, which is aimed at improving neighborhoods created by government-sponsored affordable housing programs that have deteriorated over time—an emerging issue affecting the quality of housing stock, social relations among residents, and the value of real estate assets (Nieto 2010).

THE BIASES OF CURRENT HOUSING PROGRAMS

There is a strong sector bias in the government interventions in Argentina, Chile, Colombia, and Mexico. One dimension of the bias is the predominance of programs focused on the provision of new homes to individual households. This contrasts with the scarcity of programs aimed at improving neighborhood services and the quality of the housing stock, as is shown in table 10.10. This bias leads housing programs to finance only the costs of building houses and the most basic infrastructure (road access, water and sanitation services). Only a few programs benefit groups of households or communities by improving the general amenities of neighborhoods. Yet even those programs are restricted in their urban impacts, as they mostly target informal settlements with high concentrations of poor households, thus remaining aligned with the social welfare focus of the countries' housing policies (Rojas et al. 2010), and do not contribute to the provision of infrastructure and urban services to the expansion areas of cities.

Another bias is that these countries' housing policies pay little or no attention to rental units (Gilbert 2003). This shortcoming forcefully argues for a change in outlook to encompass the many advantages of rental housing and to advocate for its promotion, or at least to adopt a tenure-neutral shelter policy. Given the central role rental housing plays in a well-functioning housing market, the United Nations supports a more proactive position on the part of governments concerning the development of rental markets (UN-Habitat 2011).

A third bias of these countries' housing programs is that in promoting the benefits of these programs, almost invariably the governments mention the number of jobs the programs will create. In some cases, programs are explicitly designed with this economic objective in mind. That is the rationale used by the Colombian government in allocating resources for interest rate subsidies for housing loans and by the Argentinean government in determining the number of houses it will build each year through its Programas Federales (Rojas et al. 2010). Consequently, in many cases the resources allocated to housing programs are estimated on the basis of the jobs created and not on actual housing needs. Designing hous-

Table 10.10
Focus of Housing Programs in Argentina, Chile, Colombia, and Mexico, 2014

Country	Number of Programs Targeting Households	Number of Programs Targeting Communities
Argentina	4	2
Chile	8	4
Colombia	4	2
Mexico	9	4

Sources: Data from SEDATU (2014) and CONAVI (2013, 2014).

ing programs with this in mind does not help target resources to, or guarantee their effectiveness in, improving housing conditions.

As can be appreciated from this analysis, the housing problems of most cities are complex and cannot be solved simply by government interventions focused on building more houses, no matter how badly needed they are.

THE LESSONS LEARNED FROM CURRENT HOUSING POLICIES

There is neither a preferred approach to housing policies in Latin America nor a recommended one. Some countries show a marked preference for the direct production of houses by public entities to supply the needs of the poor. Argentina, and to a large extent Venezuela and Brazil, are strong proponents of this approach. Such programs are effective in reaching the poor but need to be adjusted to avoid oversubsidizing households capable of paying part of the cost of a house (Cuenin et al. 2012). Furthermore, they make only limited contributions to provide the urban services and amenities that are central to improving residents' quality of life.

Other countries focus instead on exploiting private sector resources (provided by for-profit developers and home buyers themselves) to finance and pay for new houses by giving direct, one-off subsidies to beneficiaries to increase their savings and thus make private mortgages affordable. Two early adopters of this policy, Chile and Costa Rica, have reduced their quantitative shortages in this way. Such policies, however, do not reach low-middle-income households that cannot save enough for a mortgage or do not have regular incomes to qualify for one (Cuenin et al. 2012). Improved access to private sector financing for households that are able to pay has freed up public resources to assist households that cannot access private financing or that need assistance in upgrading their homes.

Programs that rely on workers' savings to fund subsidized mortgages are intrinsically limited by the availability of funds. In addition, they provide below-market returns on savings. In Brazil and Mexico, where quasi-governmental institutions have a significant presence in the housing sector, subsidized lending crowds out potential private lenders that cannot compete with subsidized loans. The gradual abandonment of this model could increase opportunities for private capital to participate in the housing sector, thereby expanding the scope and depth of the private housing finance system and making it possible to satisfy pent-up demand for mortgages, albeit at higher interest rates.

Finally, while there is nothing intrinsically wrong with associating public expenditures for housing with the creation of employment and boosting stagnant economies, it is important to keep in mind that these objectives are attained when the housing sector is functioning well. When housing production is entirely in the hands of government entities and the production and distribution mechanisms do not mobilize the paying capacity of beneficiaries, housing instruments used to boost the economy are inefficient, as they misdirect resources and do not mobilize all the potential resources available to the housing sector. Furthermore,

when the objectives of housing policies and programs are narrowly confined to the production of more houses—as is the case in most of Latin America—more public expenditures in housing exacerbate the negative urban impacts of housing production.

The Urban Impacts of the Housing Sector

The most significant urban impact of the housing sector is the incorporation of new residential land into a city's footprint. There are no reliable data on land added annually for residential use to the cities in Latin America, but the scant information available indicates that it is very significant. Estimates based on data provided by Cuenin et al. (2012) indicate that in 2006, the total land incorporated into residential use in Argentina was approximately 3,000 hectares and in Chile at least 1,800 hectares.[18] If annual new house production in Argentina and Chile stays at levels similar to those in 2006, within a decade the total incorporation of land for new houses will be 30,000 and 18,000 hectares, respectively, not counting the land required for roads, parks, and urban services. Official estimates for Mexico indicate that if current urban development trends hold, the expansion of its cities over the next 30 years will require incorporating an additional 340,000 hectares into urban uses (SEDESOL 2011) and at least 70 percent of that land—on average 8,000 hectares per year—will be used for housing and related urban services.[19]

Programs that finance new housing construction—either directly by government institutions or indirectly by the government supporting the demand for privately produced houses—have established incentives for the housing sector *not* to contribute to building better cities. These programs provide further encouragement of the essentially short-term perspective of real estate developers seeking to maximize their profits and public housing institutions to reduce costs. The cost of land is the most significant variable affecting both outcomes. To achieve lower land costs, they subdivide large plots on the urban periphery, where land is cheaper and easier to develop. Then they make the minimum investments in infrastructure and urban amenities required by the planning authorities, paying little or no attention to the mid- or long-term consequences of their actions.

18. In 2006, annual house production in Argentina—including homes built and financed by both the government and the private sector—was just under 100,000 units. If all houses were built on the 300-square-meter minimum-size lot allowed, total land consumption for that year would have been 3,000 hectares. The estimate for Chile is based on the same parameters. This estimating procedure yields very conservative results, as only some of the new houses each year are built on minimum-size lots. Condominiums, which represent approximately 30 percent of the new houses in Chile, may compensate for this bias.

19. Housing and residential related services use between 60 and 80 percent of the urban land depending on location, central areas or the periphery.

The activities of home self-builders who meet their housing needs in the informal housing market also pull urban growth out to the periphery, where most of the land that can be illegally subdivided or squatted on is located. In fact, most of the informal housing developments in Latin America contribute to expanding the footprints of cities.

Municipalities have a vested interest in the construction of houses, as most of their revenue comes from taxes on developed land or government transfers tied to the size of their population. Cities are quite willing to facilitate housing development even when they have limited institutional and financial resources to manage urban growth and to provide services to the new population. In most Latin American cities, the traditionally weak urban planning and management mechanisms are unable to counterbalance the strong pressures for peripheral housing expansion.

Under the current set of incentives originating in the interplay of housing markets, government housing policies and programs, and weak urban planning institutions, the most common urban outcomes of existing housing policies are

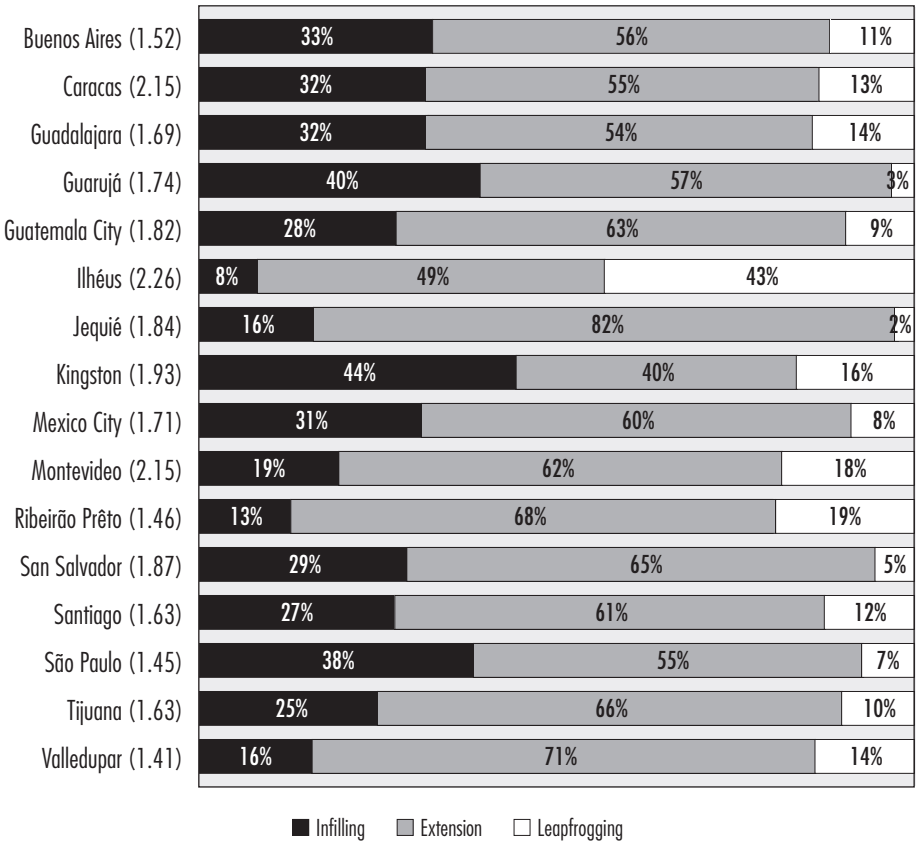
1. urban sprawl;
2. the growth of underserviced residential areas;
3. the concentration of affordable housing on the urban periphery;
4. little variety in housing types; and
5. the abandonment of inner-city neighborhoods.

The following sections examine these outcomes and identify possible solutions.

URBAN SPRAWL

Cities around the world are becoming less dense. This is the conclusion of a study documenting the global decline of urban densities (Angel et al. 2011). The trend holds for land-rich and land-poor countries in both the developed and developing worlds. Besides a decline in the density of built-up areas, other manifestations of urban sprawl include fuzzy boundaries between city and countryside, large expanses of single-use (i.e., residential) areas, leapfrogging development, and excessive fragmentation of open space. Cities in developing countries have considerably lower densities than cities in developed countries. Latin America—the most urbanized developing region—is no exception, as Angel et al. (2011) found (see table A10.6). The data indicate that between 1990 and 2000, most of the new developments occurred either (1) in open-space areas of the urban periphery (on land located less than 100 meters from the open countryside) in a process called growth by *extension*; or (2) outside the periphery in a process called *leapfrogging*. This sprawl occurs even when there is space inside the city to grow by *infilling*, defined by the authors as new development in open spaces within the city footprint. As figure 10.3 shows, most of the new land added to cities from 1990 to 2000 was by extension, representing 70–80 percent of the total growth.

Figure 10.3
New Land Developments by Location Relative to the City Footprint, 1990–2000

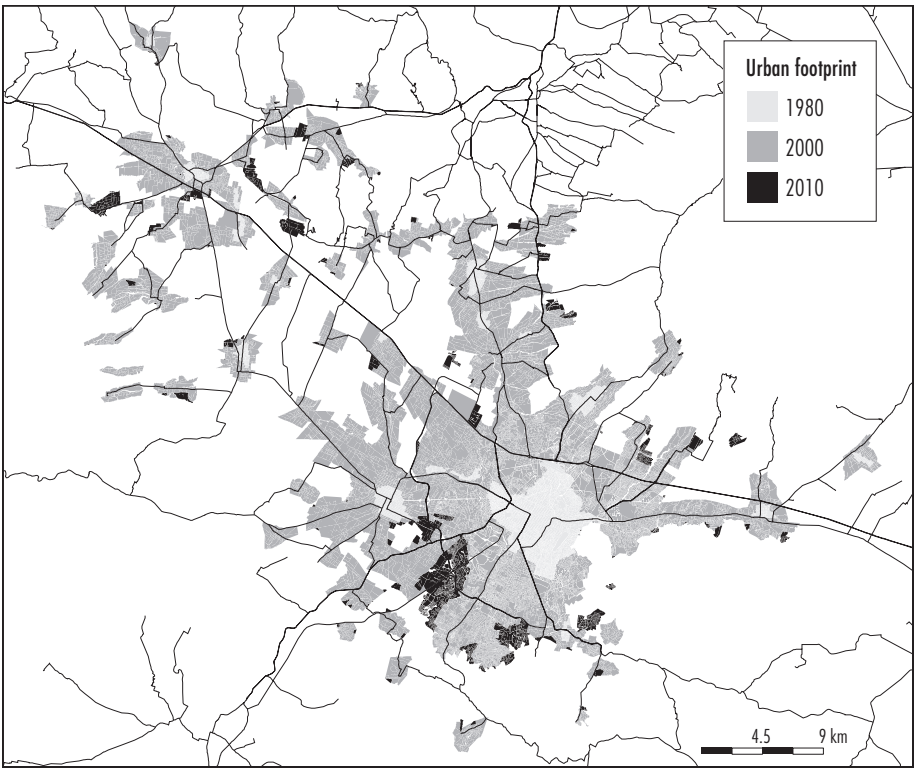


Note: Ratio of city footprint to built-up area in 1990 in parentheses. Percentages are rounded.
Source: Author calculations based on Angel et al. (2011).

An analysis of the expansion of Mexican cities in the past three decades (1980–2010) indicates that the urbanized area increased nine times faster than the population, expanding urban development on the territory of the surrounding municipalities (SEDESOL 2012). This creates a complex governance problem for the management of city growth. For instance, the urbanized area of Puebla-Tlaxcala grew at nearly eight times the rate of its population, and did so mostly in the municipalities on the periphery, where residential development took place at great speed (see figure 10.4) (OECD 2013a).

Several of the incentives discussed previously are at work in the push to extend cities, and they are strong and persistent. Private developers and landowners

Figure 10.4
Expansion of the Footprint of the Puebla-Tlaxcala Metropolitan Area, 1980–2010



Source: OECD (2013a, 118, fig. 3.1).

profit from the development of low-cost rural land, and the government is able to build more housing within a given budget when it develops cheap land on the periphery. Leapfrog development brings even more profits to landowners and developers, so this approach is used whenever possible. In this type of growth, municipalities increase their tax revenue (particularly when they are not directly responsible for the provision of water, sanitation, education, and healthcare services) and/or benefit from the population increase to capture more transfers from national and state governments. Some institutional structures, such as the sale of communal land surrounding cities in Mexico, favor this process. In other cases, such as in Santiago, Chile, developers take control of significant portions of the land available for expansion at the beginning of the process and continue to purchase land in order to ensure a steady supply of developable land (Donoso and

Sabatini 1980). Incidentally, urban sprawl does not reduce the price of serviced land. Trivelli (2010) documented this phenomenon for Santiago, a city that saw increases in land prices for almost three decades, despite the expansion of its footprint (figure 10.5). From 1982 to 2010, the median price of serviced land increased by almost seven times (prices adjusted for inflation).

The low incidence of infill development was most likely due to the higher cost of serviced land in inner-city areas. Institutional issues may also be at work. Underutilized areas of cities often have complex land tenure structures or are held by public or private institutions that are not inclined to redevelop them.

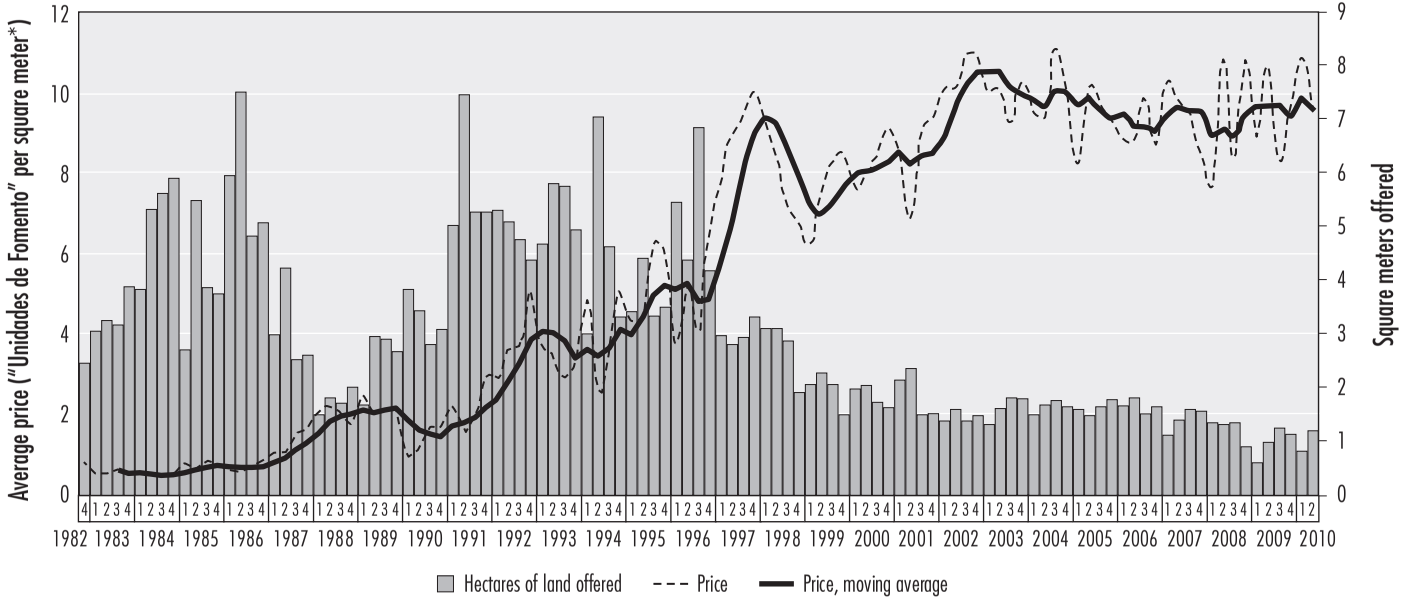
THE GROWTH OF UNDERSERVICED RESIDENTIAL AREAS

The housing construction bias of national and regional policies and programs leave the task of dealing with the urban development issues that emerge from new residential construction to municipalities. This effort is hampered by national legislation and norms aimed at promoting the construction of affordable housing that exempt developers (private and public) from providing many of the urban amenities required in other residential subdivisions, in the expectation that the local governments will supply them incrementally over time. Often private developers circumvent government regulations requiring the provision of other amenities, commonly parks and land reserves for schools and healthcare facilities, in large subdivisions by building small adjacent subdivisions that are below the size requiring enhanced amenities. Unless government regulations explicitly forbid this behavior (and the regulations are enforced), this strategy results in the construction of vast neighborhoods with only the most basic public amenities—secondary access roads, sidewalks, and public lighting—as illustrated in figure 10.6.

Most municipalities in Latin America are hard-pressed to provide the other necessary amenities, such as schools, public transit access, and healthcare services. But for a few exceptions—including large and midsize cities in highly decentralized countries such as Brazil, Colombia, and Ecuador—most local governments lack the institutional and financial resources to fully meet their responsibilities. They find it difficult to expand trunk infrastructure to new formal and informal subdivisions. In highly centralized countries such as Chile, some of these services are provided by the central government (trunk roads, education, healthcare services) or by private utilities (water and sanitation), further exacerbating the difficulty of coordinating new house construction with the provision of adequate services (OECD 2013b).[20] In addition, government housing policies are usually driven by national objectives that usually are not well matched to local needs.

20. Of the four countries discussed in detail in this chapter, Argentina, Colombia, and Mexico are far more decentralized than Chile, with the subnational governments responsible for a higher percentage of public expenditures: more than 50 percent in Argentina and Colombia and 30 percent in Mexico, compared with only 15 percent in Chile (Daughters and Harper

Figure 10.5
Changes in Price and Volume of Land Offered for Sale in Santiago (Quarterly) 1982–2010



*"Unidad de Fomento" is a unit of account that follows inflation in the economy, changing according to changes in the price index.

Source: Trivelli (2010, 5).

Figure 10.6
New Neighborhoods Without Full Urban Amenities in Torrejón, Mexico

Source: Topelson (2009).

Most municipalities face significant challenges in managing urban development. With limited manpower and institutional resources—including good-quality urban development plans, development control procedures and personnel, and agile judiciary procedures for punishing noncompliance—they are ill equipped to cope with the cumulative impact of the operations of private and public developers in the formal housing sector. This leads to mostly uncoordinated developments that have long-term impacts on the efficiency and sustainability of cities and on their capacity to provide good living conditions. There are only a few cities in Latin America where the planning, coordination, and implementation capacities of local authorities are able to counterbalance the spontaneous sector and institu-

2007). States and provinces control most of these resources; the municipal share is only around 15 percent in Argentina, Colombia, and Mexico, and as low as 7 percent in Chile (OECD 2013b).

tional bias of developers. In these cases, the city is able to pursue a long-term vision of its desired development path, safeguard the common interest, and ensure the sustainability of its urban development process.[21]

THE CONCENTRATION OF AFFORDABLE HOUSING ON THE URBAN PERIPHERY

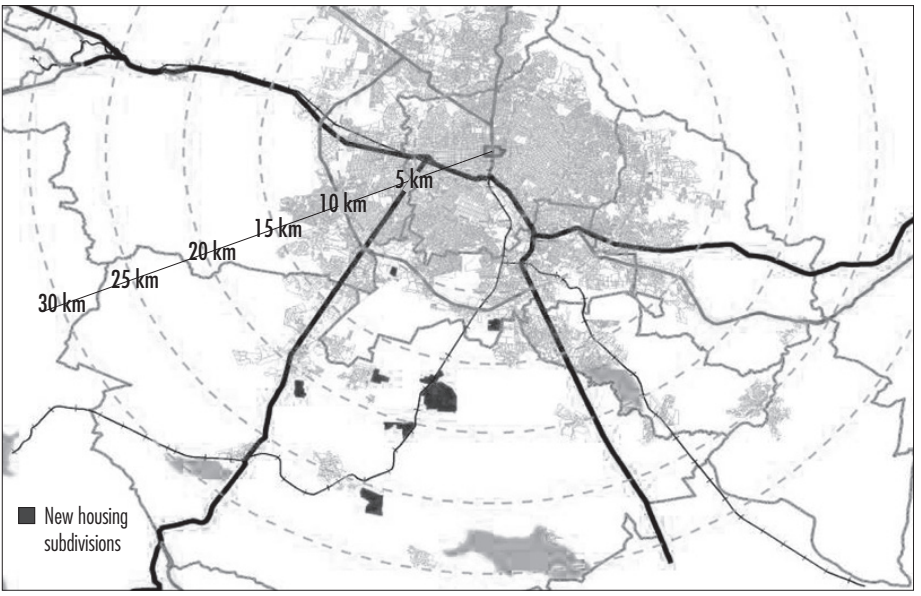
The search for cheap land drives the decisions of private and public housing developers. New housing developments tend to be located in areas that are far from city centers or other areas that concentrate services and employment. Topelson (2009) reports on new housing estates in Mexico built on land located up to 25 kilometers from Guadalajara's city center, using cheap communal land in municipalities willing to grant building permits (figure 10.7). This process also takes place in Santiago, where according to Trivelli (2010) almost all affordable housing built in the last decade is in locations 20 kilometers or more from the city center where the cost of land allows building houses within the cost ceiling set by the government subsidy schemes.

One of the consequences of developing affordable housing on the urban periphery is the concentration of houses all of the same type and price. An example of this situation is found in Santiago. Over the past several years, most of the new houses for low-income households financed by the public sector were built in neighborhoods where house prices were below US$28,000 (the lowest price on the market in 2014). These houses are attractive only to low-income households that cannot afford to buy homes in any other location. Due to the low prices of the homes, residents are exempt from paying land taxes and do not contribute to the financing of the municipal services they require.

Municipalities in Chile cannot count on their own resources to address the deficits in urban services. The combination of property tax exemptions for low-cost houses and inadequate central government transfers results in a shortfall in revenue. In Chile's highly centralized public management structure, the national government agencies in charge of the provision of trunk infrastructure, healthcare services, education, and recreation facilities do not coordinate their programs with the municipalities or with the national housing agencies; thus, these services are not normally provided in sync with the construction of houses (OECD 2013b). Worse still, the amenities in these areas do not improve over time, leaving the residents stuck in low-quality neighborhoods. The lack of amenities contributes to the unattractiveness of the neighborhoods and the low value of their housing. This situation is not unique to Chile; all Latin American cities have residential areas with below-average amenities.

21. The best-known cases are Curitiba, Brazil, and Medellín, Colombia. In the past, other cities—such as Belo Horizonte and Porto Alegre, Brazil; Bogotá, Colombia; and Montevideo, Uruguay—have also managed to coordinate urban development and housing policies.

Figure 10.7
Location of New Housing Developments Outside Guadalajara



Source: Topelson (2009).

Another common policy that contributes to this outcome is special subdivision ordinances that seek to reduce the cost of residential land for affordable housing developments. Such developments are often allowed to use low-cost house designs and provide limited neighborhood amenities. Special land subdivision regulations, such as Brazil's Áreas Empecilhais de Interesse Social, or AEIS (Special Areas of Social Interest), exist in almost all countries. In some cases, as in El Salvador, these subdivisions are built by the private sector taking advantage of provisions in the law that allow the subdivision of rural lands with little or no services (Ruiz 2010). As a result, these legally subdivided neighborhoods lack urban amenities in much the same ways that squatter and other informal settlements do (Couriel 2010).

In sum, with the exception of a handful of neighborhoods housing mostly high-income households, most of the residential space in most Latin American cities is taken up by formal and informal neighborhoods with significant shortages of infrastructure and urban services. The lack of services and amenities has a significant impact on quality of life, given that most of the services provided by a house to its users come from the neighborhood. Out of the nineteen housing services listed in table 10.11, the individual house provides residents with only five

Table 10.11
Services Provided by a House, Classified by Source

Source	Service
House	Access to a plot of land
	Protection from the weather
	Bathroom and kitchen facilities
	Privacy
	Sufficient living space
Subdivision	Access roads
	Drainage
	Public lighting
	Community parks
Neighborhood	Piped water
	Sewerage
	Waste collection
	Healthcare services
	Education
	Recreation facilities
	Parks
City	Resident security
National government	Secure tenure
	Land title

services, and the subdivision or neighborhood provides eleven services. The remaining three services are the responsibility of the city or national government.

Housing programs that are area focused are mostly concerned with the problems of squatting or illegal settlements. Settlement upgrading programs, such as those in Argentina and Colombia, solve the environmental, infrastructure, urban services, and land tenure shortages of specific settlements, usually selected for intervention due to their high concentration of households living in extreme poverty. These programs do not accommodate the needs of the urban areas surrounding the informal settlements (providing only connections from the settlements to the trunk infrastructure), a situation that tends to create islands of well-serviced neighborhoods amid seas of urban shortages (Couriel 2010). This shortcoming of the current programs begs for a shift to a citywide approach that would result in the upgrading of all substandard residential areas, not just illegal settlements. Such an approach has yielded good results in Medellín, Colombia, for example (Brand and Davila 2011).

Current practices pertaining to the design, implementation, and management of public spaces in affordable housing subdivisions are problematic. Although land reserves are required in these subdivisions for the provision of recreation and community facilities, they are almost invariably not supplied with the required equipment or put under the ownership and control of local stakeholders. They remain in a sort of limbo between the public spaces that are controlled by the municipalities—fundamentally, the streets and public parks—and the houses or apartments that are the private property of the households. The lack of amenities and the ambiguity of ownership and control over this common land, when coupled with the lack of municipal resources to operate and maintain its own public spaces, contribute to the rapid physical deterioration of the neighborhoods (Rojas 2010b). In 2010, an estimated 3,000 affordable housing neighborhoods in Chile were in advanced stages of deterioration (Nieto 2010). This harsh reality led the government to implement the Quiero mi Barrio (I Love My Neighborhood) program, which is an attempt to mitigate the physical and social ill effects of such neighborhoods.

LITTLE VARIETY IN HOUSING TYPES

Another detrimental feature of Latin American housing programs is the tendency to build a limited number of housing types that are inexpensive and easy to construct. Public and private developers behave similarly in this respect. Figure 10.8 shows such a housing tract built by private developers in Mexico for sale to households receiving loans from government-sponsored institutions. The size and features of such houses are mostly determined by government regulations and budget considerations, and they rarely meet all the needs of the residents, who would generally prefer larger houses or at least houses that could be easily expanded to suit their needs.

THE ABANDONMENT OF INNER-CITY NEIGHBORHOODS

Although inner-city neighborhoods have urban services and better access to employment than the periphery, very few affordable houses are built there. This trend is in part responsible for the low proportion of city growth that takes place through infill development in Latin America (see figure 10.3). The higher land prices and complex land tenure structure of the consolidated areas of cities are strong disincentives for private developers and public housing agencies, as they are extra costs that will reduce profits for developers and prevent housing agencies from building the maximum number of affordable houses at the minimum cost. If, however, an analysis of the costs and benefits of new housing on the urban periphery includes the expenditures that homeowners must make on a daily basis to access their employment or urban services from the homes far from the city center, those extra costs may not be that high. Residents of subdivisions on the periphery end up paying for developers' and agencies' lower costs in the form of travel time and transportation expenses, both of which exact a high price on

Figure 10.8
The Repetition of Housing Types in Mexico

Source: Topelson (2009).

the productivity of the urban economy.[22] In this regard, an Inter-American Development Bank study on the sustainability of urban development states, "In . . . five surveyed cities, 28.1 million people travel 1 hour and 30 minutes or more a day. This is equivalent to 10 working weeks per year per person" (IDB 2014, 7).

Redeveloping land located in inner-city areas is not that much more expensive than developing land on the periphery if the costs of extending network infrastructure and other urban services are taken into account. It is the taxpayers and users of this infrastructure who take on these costs, not the developers or housing agencies. Most cities have unused or underused land close to the center that can be captured for affordable housing: unused infrastructure such as railroad yards

22. Martim Smolka of the Lincoln Institute of Land Policy calls this transportation expense "the mortgage payment of the poor" (personal communication with the author).

or decommissioned airfields, ports, or military bases; unused land controlled by large institutions such as hospitals, education centers, or charitable organizations; abandoned industrial facilities; and underoccupied, deteriorated residential neighborhoods. Often there is also vacant land in the outer growth rings of the city, a great deal of which is in the first and second rings, still close to employment and services located in the core inner city.

In the late 1990s, 40 percent of Rio de Janeiro's net urbanized area (total area minus streets, parks, and protected areas) was underutilized or empty. The great majority of the empty land (70 percent) was in large parcels of one hectare or more (Furtado and Leal de Oliveira 2002). Similarly, in 1994 almost half the parcels in the metropolitan area of Buenos Aires were vacant (Clichevsky 2002). Though dated, this information gives some indication of how the situation may look at present: there might still be a significant proportion of such land, most of it controlled by institutions or companies that have relocated to new areas.

There is also undeveloped land in the outer development rings of most cities, some of which was retained for speculation, and some kept in reserve by developers. In 2010, there were an estimated 120,000 hectares of unused land within the urban footprints of the cities of Mexico (SEDATU 2013), which would be sufficient to cover one-third of the total land area in that country expected to be incorporated into urban uses by 2040, if current city growth trends persist (SEDESOL 2011).

Developing this inner-city land poses significant institutional challenges. The three most important are (1) the need to establish institutional mechanisms to take control of this land and to promote its development, which would require creating effective public-private partnerships (Rojas 2004); (2) using taxes and incentives to prevent the retention of undeveloped land, including attaching idle-land surcharges to the property taxes for unused plots (Ravindra 1996); and (3) undertaking land readjustment projects to provide the infrastructure required to put the land into residential use. The redevelopment of former industrial sites, or brownfields, poses environmental hazards that private developers find difficult to address and finance. Government assistance could be justified for environmental cleanup on the basis of the multiple social benefits and positive externalities generated by redeveloping such sites (Iannone 1995; Wright and Davlin 1998).

THE URBAN LIABILITIES OF SECTOR-FOCUSED HOUSING POLICIES

As discussed in the preceding sections, cities are the main casualties of the system of incentives established by the narrowly sector-focused housing policies and programs currently being implemented in Latin America. The urban impacts of the housing developments documented here constitute important urban liabilities. The most significant impact is the lack of good access to jobs and services, which drives households to abandon their homes, leading to the deterioration of the neighborhoods, with consequent private and public losses.

The distance of the new subdivisions from employment and service centers forces people to spend a significant amount of time and money moving from home

Table 10.12
Commuting Travel Times to Work or Urban Services (round trip) in Selected Cities, 2014

City	Average Travel Time	Percentage of People Traveling 1.5 Hours or More per Day
Mexico City	1:36	44
Buenos Aires	1:11	27
Bogotá	1:34	50
São Paulo	1:37	40
Lima	1:21	38

Source: IDB (2014).

to work, school, and healthcare facilities. A large number of Latin American cities report increasing travel times. In extreme cases, travel to work and other services takes nearly three hours each way, and residents spend 40 percent of their income on transportation costs. One study found that "on average, inhabitants of . . . five surveyed cities travel 1 hour and 28 minutes to make their most frequent commute (round trip)" (IDB 2014, 7). Table 10.12 displays the results of this survey. Households are paying with travel time for the savings in land costs realized by private developers and public housing institutions.

Distant and underserviced neighborhoods provide but a small number of the services expected from a house (see table 10.11). The absence in the new housing subdivisions of many of the traditional services provided by neighborhoods or the city lead many households to develop a profound dissatisfaction with their homes. They often find that they are not able to live in peripheral locations, as they continue to work for their former, faraway employers and have very limited or no access to essential urban services. Many unsatisfied residents end up renting out or abandoning their homes. From 2000 to 2010, the number of empty units in Mexico's housing stock increased from three million to five million units (table 10.13). Such a high proportion of empty houses is similar to that of Argentina and more than double the percentage in the United States and Germany and is only comparable with that of Spain, Portugal, and Ireland at the peak of the 2008 financial crisis (OECD 2015).

Latin American cities are facing a growing challenge posed by housing policies and programs that focus exclusively on residential financing and production and that do not pay attention to the full array of urban services required to provide a good quality of life. Governments are investing large sums to develop the network infrastructure and urban services and amenities required by subdivisions on the urban periphery, but they are neglecting underutilized and empty urban land, particularly in inner-city areas. Unless there is a change in the way the housing sector relates to the development of cities, these trends are likely to continue

Table 10.13
Use of Housing Stock in Mexico, 2000 and 2010

Use	2000		2010	
	Number of Units (millions)	Percentage of Stock	Number of Units (millions)	Percentage of Stock
In use	21.9	84.5	28.6	80.4
Empty	3.0	11.6	5.0	14.0
In temporary use	1.0	3.9	2.0	5.6
Total	25.9	100	35.6	100

Source: CIDOC (2012).

and even increase, based on the fact that most of the region's countries have experienced sustained economic growth over the past decade and a rise in purchasing power that will drive people to consume more housing and more housing-related urban services.

Arguments for an Urban-Based Approach to Housing Policies

Latin America's experience with housing—particularly the progress made over the past two decades in improving access to better housing and thus reducing the absolute and relative numbers of households facing quantitative and qualitative housing shortages—indicates that any government concern for improving the living conditions of urban populations must include a concern for a well-functioning housing sector. The region's experience also shows that when housing policies and programs are designed and implemented with little regard for their urban impacts, they provide only a partial solution to the problem. By focusing only on the set of housing services provided by a house, these policies end up exacerbating urban development trends that are detrimental to the urban population's quality of life.

URBAN HOUSING DEVELOPMENTS MEET RESIDENTS' NEEDS

The main driver of informal settlements and meager living conditions in many cities is the inability of the formal housing sector to produce enough houses to satisfy the demand from new households and to reduce the backlog of unsatisfied needs. It is also true that the houses produced by the formal sector are mostly unaffordable for low- and middle-income households. The informal production of houses—outside regulations and mostly substandard—will continue to exist as long as the formal sector produces an insufficient number of affordable houses.

But these problems also are related to the housing sector's unintended urban impacts. The most significant of those impacts is the exacerbation of urban sprawl, which stresses the capacity of cities to provide network infrastructure and urban services to rapidly expanding peripheral neighborhoods. This situation promotes the emergence of legally developed but underserved neighborhoods. These new residential areas, when poorly connected with the rest of the city, impoverish residents, making it difficult for working-age members of households to have access to new and better sources of income and personal development opportunities, and for other members of households to access basic urban services such as schools and hospitals.

It follows that government policies aimed at improving housing conditions must focus not only on expanding the flow of affordable houses and improving the quality of the existing housing stock, but also on ensuring that new residential areas are supplied with the necessary infrastructure and urban services and have good access to transportation, sources of employment, and other amenities. This study shows some of the social and economic losses brought about by sector-focused housing policies. The demographic and economic trends that will affect urban development in the coming years point to an escalation of these losses unless a change in policies takes place.

This study shows that there is a real opportunity to add more resources to the housing sector by channeling part of the incomes of the expanding middle class to pay for most of the cost of a house. The development of housing finance programs will induce private developers to produce a diversity of housing solutions catering to the needs and purchasing capacity of households in all income brackets capable of paying for a home. Expanding housing finance options and access to them for middle-income groups is possible, as the success attained by countries such as Chile, Colombia, Costa Rica, Ecuador, and Mexico proves.

Despite such down-market movement on the part of the private sector, ensuring wider access to credit and a reasonable supply of low-cost dwellings remains a significant challenge, particularly for the high proportion of workers who are self-employed, small entrepreneurs with irregular incomes, or employed in the informal sector. More challenging still is guaranteeing that the new housing products directed to various segments of the housing market have the urban amenities required to provide residents with all the services they need.

There is also a real opportunity to improve the housing conditions of low-income households with well-targeted and efficiently implemented public programs, particularly those that allow people to tap into their household resources in order to incrementally build and improve their homes. Incremental housing construction and home improvement programs exist in most Latin American countries, but they need to be brought to scale to help households that still cannot access long-term financing to purchase good-quality homes (Azevedo, Bouillon, and Chevalier 2012).

To make lasting improvements in people's living conditions and to ensure that investments in housing contribute to enhanced economic and social development

opportunities, the housing sector should create programs that encourage cooperation with city governments in directing developers to build new housing subdivisions in suitable areas, provide these neighborhoods with good accessibility and transportation to city centers, and put in place all requisite urban amenities.

LINKING HOUSING PROGRAMS AND URBAN DEVELOPMENT MAKES SENSE

One of the most significant findings of this study is that improving the functioning of the housing sector and assisting the very poor to get houses may not be an effective strategy if the urban impacts of housing production and consumption are ignored. For decades, governments in Latin America have focused unilaterally on increasing the production of new houses within the constraints imposed by available resources. Yet massive housing production on the urban periphery has created many of the urban problems described in this chapter.

Countries would do much better to link the production of new houses with the provision of urban amenities: good transportation; healthcare, education, and recreation facilities; community parks and services; citizen safety; and employment opportunities. This strategy calls for breaking away from the traditional sector-focused housing programs and moving instead to a more city-focused set of policies aimed at improving the living conditions of the urban population and promoting the growth of the urban economy.

This call for a policy shift reflects the significant changes in housing conditions experienced in Latin America over the past decade. The most significant type of housing shortage today is a lack of network infrastructure and urban services in neighborhoods. The second-largest shortage is related to the size and quality of houses. Governments should significantly shift their priorities from building new houses to implementing programs that will improve the infrastructure and the quality of the existing housing stock.

The expansion of new housing production and the related commercial and recreation services that will be required over the next two decades to meet the demand of middle-income households will put additional pressure on the supply of serviced land and will result in price increases. The price of serviced land is already beyond what governments can afford to pay for building subsidized housing, and even beyond what middle-income households can afford, even with access to long-term financing. Further increases in land prices could slow down or arrest the progress made in improving the affordability of housing.

A new set of goals to improve the living conditions of the urban poor must have the scope required to make a significant dent in the problem. It would be unwise not to take the experience of the past two decades into account in the design and implementation of a new generation of housing policies and programs. This study indicates that these new policies should be based on the following goals: (1) attract more private resources (from both entrepreneurs and households) to the housing sector in order to expand production; (2) adopt a citywide approach to improve the living conditions of the population in addition to providing houses

for the poor and upgrading substandard informal settlements; and (3) promote a greater convergence of the different urban land development processes, especially the residential land development process and the public and private investment process that contributes to building better cities.

Goal 1: Attract More Private Resources A comprehensive approach to addressing the housing problems of all income groups and their related urban impacts requires increasing the mobilization of private sector resources, from both investors and households, to finance new houses. Housing policies should be expanded to include not just low-income households but also underserved, nonpoor low-income and lower-middle- and middle-income households to assist them in accessing private financing that captures their capacity to pay for part of the costs of housing. This study shows that this approach can achieve the goal at a lower cost to the public sector than directly supplying these groups with houses and neighborhood services. The public resources that would be liberated by this approach could be targeted to assist the very poor who cannot pay for even a basic house. Supporting middle-income and other nonpoor low-income households in accessing private mortgages could greatly increase the resources devoted to housing and to the economy, boosting employment in the related industries.

Each income group faces different challenges in accessing housing, and each country has different fiscal capacities to provide public support for housing, so the instruments to assist these groups should differ, too.

In middle-income developing countries with larger pools of fiscal and institutional resources, these objectives could be accomplished with direct subsidies for households that are on the verge of qualifying for private sector financing. The subsidies could help households secure private loans to pay for new houses or to expand or improve their current homes. These countries have sufficient public resources to provide basic houses for the very poor and to assist them in improving their current homes incrementally.

In low-income developing countries with limited public resources, this approach would be more difficult to implement, and the targeting of public funds would have to be very precise. These countries would probably benefit greatly from reforms to the regulatory environment affecting the development of housing financing to expand the supply of credit to middle-income households, a low-cost strategy that could bring more resources to the housing sector. A complementary strategy would be to facilitate the self-construction process commonly used by households in the lower-middle- and low-income brackets. According to Greene and Rojas (2008), housing programs could then focus on expanding the supply of serviced land, good-quality building materials, and technical support to households willing to devote their savings and hard work to building and improving their own homes.

Goal 2: Adopt a Citywide Approach Substandard neighborhoods are not confined to areas that have been informally developed. With the exception of a

handful of neighborhoods with mostly high-income households, most cities in the developing world have formal and informal residential areas with varying degrees of infrastructure and service shortages. These shortages have significant impacts on residents' quality of life, given that the majority of the services provided by a house to its users come from neighborhood services. Furthermore, government programs concerned only with squatting and illegal settlements tend to create islands of well-serviced neighborhoods in seas of urban infrastructure shortages.

An integrated approach to improving substandard areas of the city requires a wide variety of interventions implemented in both illegal and legal residential areas lacking municipal services such as a continuous supply of potable water, healthcare and education facilities, good drainage and sanitary disposal of waste products, paved roads, street lighting, telecommunications, transit access, and parks and recreation areas. Housing policies need to take into account these needs. Governments must promote the convergence of the different institutional and financial mechanisms available to provide cities with a good quality of life. Investments in urban infrastructure and services should be done in consonance with residential expansion. The integrated planning of new developments must be emphasized. Planning and policy tools can be used to accomplish this objective, including area plans, adequate facilities ordinances, transit-oriented development, neighborhood improvement programs, urban rehabilitation, and urban heritage conservation. Rapidly growing cities, such as middle-size cities throughout Latin America, need to plan their expansion areas with a long-term perspective in mind that will protect the environment and enhance the efficient functioning of the city. Within the bounds defined by this long-term perspective, planning authorities can designate the land needed in the middle and short terms to accommodate the needs of private and public housing developers.

Also critical is for city governments to have the resources to provide urban infrastructure and services. Much progress has been made in the provision of sanitation services with both the consolidation of well-run and well-financed public utilities and the direct government support given to low-income households to ensure they can afford a minimum level of consumption of these services. The provision of healthcare and education is still a challenge for city governments and for relevant central and regional government institutions. A gradual elimination of the deficits in urban services will allow these entities to plan their investments in anticipation of housing developments.

Although most Latin American cities are still incapable of fully implementing planning instruments such as "adequate facilities ordinances," which limit new housing developments in underserved districts, housing policies can contribute to the objective of building adequate urban infrastructure and amenities in advance of developing residential land by providing city governments with the resources to do so. Central or regional governments can provide municipalities with block grants to attend to the demands made by new residential areas. This means that in addition to the need to provide support to individual households, which is at

the core of the enabling markets approach, there is a need to provide city-building support to local governments. Block grants matching own-source local contributions can accomplish this objective, preventing the pitfall of fiscal laziness that comes with too much support from national and regional governments.

Goal 3: Promote a Greater Convergence of the Different Urban Land Development Processes The expanded demand for housing and urban services from the emerging middle class and the more empowered low-income households will increase the demand for urban land for residential use. Unless something is done to curb the increase in land prices, consumers and developers will have to pay more for urban land, diverting resources from consumption and investment, respectively. To protect the common interest, improve living conditions, and facilitate urban economic growth, governments must put in place measures to promote the development of residential land at affordable prices.

To moderate land price increases, governments need to invest in trunk infrastructure in order to put more land into residential use. However, this strategy requires complementary measures to prevent inefficient speculative behaviors by landowners, promote public-private cooperation in the development of residential areas, and facilitate the efficient use of underused land in inner cities. Measures to curb land prices can include capital gains taxes, special assessments that capture unearned land price increases to help defray infrastructure costs (Iracheta and Smolka 2000; Sandroni 2011; Smolka and Iracheta 1999), and other tax measures that enable the government to transfer to landowners the social costs of their decisions. Idle-land taxes are one example of the measures that can help prevent owners from keeping land off the market for speculative purposes.

Other strategies are needed to ensure a sufficient supply of affordable residential land. Inclusive planning ordinances, in conjunction with the development of residential land for the market, can help generate some affordable residential land. Public intervention in land development may work if it is well managed. For example, expanding the supply of affordable land is the main objective of Colombia's Macro-Projects, government-sponsored land development projects that are financed through the sale of large-scale lots to commercial developers while retaining a proportion of the developed land for affordable housing. Public-private cooperation is also possible, as successful land readjustment projects in Bogotá and other cities show (Torres and García 2010). Under the right political and institutional conditions, even informal land developers can be induced to cooperate in the construction of better cities, as demonstrated by the municipality of Porto Alegre, Brazil. Its Social Urbanizer scheme induced illegal land developers to produce better-quality residential subdivisions (Smolka and Damasio 2005).[23]

23. According to Smolka and Damasio (2005, 1), "A Social Urbanizer is a real estate developer registered with the municipality who is interested in developing in areas identified by the government as suitable for low-income housing, and who agrees to operate according to certain

Another important strategy is to put on the market more serviced land in infill areas and other suitable expansion areas. To do this, cities need to establish institutional mechanisms that promote fruitful cooperation among private and public stakeholders in urban land management. As discussed by Garay et al. (2013) and Rojas (1995) among others, public and mixed-capital land development institutions, as well as other forms of strong public-public and public-private partnerships, have had good results. These models should be adapted and incorporated more broadly into the urban land management mechanisms of Latin American cities.

AN URBAN-BASED APPROACH TO HOUSING IS VIABLE

All the measures detailed here are viable. Countries and cities in Latin America currently use them individually or in conjunction with other policies. These measures must be used together with housing policies to ensure that underserved residential areas and price increases for fully serviced residential land do not jeopardize achieving housing policy objectives. Latin American countries have come a long way in their concern for the living conditions of urban populations, but unfortunately they have taken a unilateral approach, focusing almost exclusively on housing conditions and downplaying the role of urban infrastructure and services. This oversight is costing citizens a great deal. The solution requires a bold change in outlook. Instead of focusing on the production of more houses and relying on the automatic responses of public utilities, government entities, and municipalities to the demands of new residential areas, housing policies and the entities in charge of their design and implementation need to focus on the full array of services required by households that are provided jointly by the house, the neighborhood, and the city. Public support for housing must turn into public support for good urban living conditions through the coordination in time and space of the interventions of all the entities providing housing services. If this coordination requires additional financing, government allocations for housing policies and programs must include it.

Housing policies and programs must shift away from individual entitlements implemented by central government entities and toward area-focused policies that seek to improve the living conditions of the entire urban population. They would still be financed mostly by the central government, as they are income-distributing as well as city-building policies. However, local governments and regional entities in charge of managing urban development would be better at

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negotiated terms, including the affordability of the serviced plots. The process contemplates a public-private partnership through which the municipality commits to make certain urban norms and regulations more flexible, to speed up the licensing process, reduce the legal requirements, and recognize progressive, step-by-step urbanization. It also anticipates using the transfer of development rights as a stimulating mechanism for private developers. Other incentives may take the form of access to specific lines of credit or certain direct public investments in urban infrastructure so the costs are not passed on to the final buyer."

implementing them. This condition poses the challenge of devising the appropriate fiscal and institutional mechanisms needed for the efficient implementation of national policies by local governments. But it is doable.

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APPENDIX: NATIONAL HOUSING PROGRAMS IN ARGENTINA, CHILE, COLOMBIA, AND MEXICO

Table A10.1
Public Urban Housing Programs in Argentina, 2014

Focus	Entity	Program	Description
Household	Programas Federales de Vivienda, Crédito (Federal Housing Loans Programs)	Fondo Nacional de Vivienda FONAVI (National Housing Fund)	Funds from the federal government to finance affordable housing projects undertaken by the Institutos Provinciales de Vivienda (Provincial Housing Institutes) state-level entities. Currently, federal funds account for 50% of the financing, with the remaining coming from the provinces. Beneficiaries must repay the cost of the houses.
		Programa Crédito Argentino PROCREAR (Argentinean Loan Program for the Bicentennial)	Mortgage financing for 400,000 low-interest home loans; initially a four-year program launched in 2012 and financed with resources from workers' retirement savings.
	Programas Federales de Vivienda, Transferencias (Federal Grant-Housing Programs)	Programa Federal de Solidaridad Habitacional (Federal Housing Solidarity Program)	Federal grants to low per capita income provinces or municipalities to support the construction of affordable houses (FONAVI standards) by private construction companies that hire local labor.
		Programa Federal de Construcción de Viviendas (Federal Housing Construction Program)	Federal grants for the construction of affordable houses by the Provincial Housing Institutes.
		Mejor Vivir (Better Living)	Federal grants to finance subsidies for households in need of improving their homes due to the lack of in-house piped water or an in-house bathroom; inadequate flooring, roofs, and walls; and insufficient rooms to prevent overcrowding.

(continued)

Table A10.1 *(continued)*

Focus	Entity	Program	Description
Neighborhood	Federal Neighborhood Improvement Grant Programs	Programa de Mejoramiento de Barrios PROMEBA (Settlement Upgrading Program)	Federal grants for improvement of infrastructure and urban services in substandard urban neighborhoods.
		Programa Mejoramiento Habitacional e Infraestructura Básica PROMHIB (Housing and Basic Infrastructure Improvement Program)	Provides financing for improvement of infrastructure and urban services in substandard neighborhoods of small towns, rural areas, and native settlements.

Source: Data from SSDUV (2014).

Table A10.2
Public Urban Housing Programs in Chile, 2014

Focus	Program		Description
Household	Compra tu Vivienda (Buy Your House)	I Subsidy for emerging groups without loan	Up-front subsidy for low-income households contributing their savings to purchase of minimal house: Savings = 2%; Subsidy = 98%
		II Subsidy for emerging groups with optional loan	Large up-front subsidy for low-income households with capacity to save requiring them to contribute their savings and the proceeds of a mortgage loan for the purchase of a small affordable house: Savings = 6%; Subsidy = 52%; Mortgage = 42%
		III Subsidy for middle-income households with optional loan	Small up-front subsidy for middle-income households contributing their savings and the proceeds of a mortgage loan for the purchase of medium-size affordable house: Savings = 8%; Subsidy = 20%; Mortgage = 72%
		IV Subsidy for construction of house for emerging groups	Large up-front subsidy for low-income households contributing their savings and the proceeds of a mortgage loan to build house on land owned by the beneficiaries or their families: Savings = 6%; Subsidy = 52%; Mortgage = 42%

(continued)

Table A10.2 *(continued)*

Focus	Program		Description
		V Subsidy for construction of house for middle-income households	Small up-front subsidy for middle-income households contributing their savings and the proceeds of a mortgage loan to build house on land owned by the beneficiaries or their families: Savings = 8%; Subsidy = 2%; Mortgage = 72%
	Mejorar tu Vivienda (Improve Your House)	I Expansion and improvement	Up-front subsidy for low-income households willing to expand and improve their minimal or affordable housing.
		II Expansion	Up-front subsidy for low-income households willing to expand their minimal or affordable housing.
		III Thermal insulation	Up-front subsidy for low-income households willing to improve insulation of their minimal or affordable housing.
Neighborhood	Mejorar tu Barrio (Improve Your Neighborhood)	Neighborhood rehabilitation	Central government grants for the provision of infrastructure and urban services in deteriorated neighborhoods containing government-supported affordable housing.
		Improvement of neighborhood and community facilities	Central government grants to improve the public spaces, common areas, and community facilities in neighborhoods containing government-supported affordable housing.
		Street and sidewalk paving	Central government grants to pave roads, sidewalks, and pedestrian walkways in low-income neighborhoods.
		Improvement of public spaces	Central government grants for improving or rehabilitating public spaces in heritage neighborhoods and other urban heritage sites.

Source: Data from MINVU (2014).

Table A10.3
Public Urban Housing Programs in Colombia, 2014

Focus	Program	Description
Household	Vivienda Gratuita (Free House)	Provides 100,000 low-cost houses for low-income households that cannot access credit and for displaced and vulnerable households.
	Vivienda para Ahorradores, or ABC (Housing for Savers)	Provides up-front subsidies for middle- and low-middle-income households to supplement household savings and private bank loans to purchase finished homes.
	Subsidized mortgages	Interest rate subsidies for a limited number of mortgages to purchase Priority Interest Houses (VIP) and Social Interest Housing (VIS). Number of mortgages defined annually in line with the government's economic recovery goals.
	Ahorro Programado (Programmed Savings)	Promotes savings for home purchase linked to the Family Housing Subsidies.
Neighborhood	Macro-proyectos (Macro-projects)	Large integrated land subdivisions to supply residential lots for fully subsidized houses (VIP), partially subsidized houses (VIS), and market houses.
	Mejoramiento Integral de Barrios (Integrated Neighborhood Improvement Program)	Provides financing for improvement of infrastructure and urban services in substandard neighborhoods.

Source: Based on data from Minvivienda (2014).

Table A10.4
Public Urban Housing Programs in Mexico, 2014

Focus	Entity	Program	Description
Household	Federal Housing Grant Programs	Consejo Nacional de la Vivienda CONAVI (National Housing Council)	Provides up-front subsidies and mortgage payment subsidies to low-income households to purchase an affordable house (new or existing), to improve an existing house, to acquire a lot with services, or for self-construction. For beneficiaries with a monthly income of five times the minimum salary.

(continued)

Table A10.4 *(continued)*

Focus	Entity	Program	Description
		Fideicomiso Fondo Nacional de Habitaciones Populares FONHAPO (National Affordable Housing Fund Trust) Programa Tu Casa (Your House Program)	Provides subsidies for very low-income households (below the five times the minimum salary line) to acquire a new house or to expand or improve an existing one. Federal funds are matched by local government funds and a small in-kind contribution from the beneficiary.
		Vivienda Digna (Good Housing)	Provides subsidies to low-income households for home improvements.
	Federal Housing Loan Programs	FOVISSTE (Housing Fund of the Public Servants' Social Services and Social Security Institute)	Provides housing loans to public servants.
		Instituto del Fondo Nacional de la Vivienda para los Trabajadores INFONAVIT (Workers' National Housing Fund Institute)	Provides housing loans to private sector employees using the mandatory employers' contribution of 5% of the salary paid to workers. Loan programs Purchase of new or used houses Build a house House improvements
		Instituto de Seguridad Social de las Fuerzas Armadas de México ISSFAM (Mexican Armed Forces Social Services Institute)	Provides housing loans to members of the armed forces.
		Fondo Nacional de Garntías a la Vivienda Popular FONAGAVIP (National Guarantee Fund for Low-Income Housing)	Provides guarantees for loans provided by private financial institutions (which manage funds provided by public institutions) to low-income households willing to self-build or improve their existing home.
		Sociedad Hipotecaria Federal, SHF (Federal Mortgage Society) Mortgage rediscount facility	Second-tier financial institutions provide liquidity to private mortgage originators: private general banks and SOFOLES (limited-purpose financial institutions).
Neighborhood	Federal Neighborhood Upgrading Programs	HABITAT Program	Provides financing for upgrading infrastructure in substandard city blocks together with social infrastructure.

(continued)

Table A10.4 *(continued)*

Focus	Entity	Program	Description
		Rescate de Espacios Públicos (Public Spaces Rehabilitation)	Builds or rehabilitates public spaces such as parks, community centers, and sports facilities.
		Rehabilitación de Conjuntos Habitacionales (Rehabilitation of Housing States)	Improve the living conditions of affordable housing neighborhoods by means of building or rehabilitating public spaces.

The author is grateful for the help provided by Carolina Piedrafita in compiling this information.
Sources: Data from SEDATU (2014) and CONAVI (2013, 2014).

COMMENTARY
Stephen Malpezzi

As its title promises, Eduardo Rojas's chapter surveys housing policies and selected housing market outcomes in Latin America over the past 50 years. It covers an impressive amount of ground, but as with any treatment of such length, some important topics are discussed too briefly or not discussed at all. The following comments are intended to complement and extend the arguments in Rojas's fine contribution.

The very first paragraph sets out the central question for housing policy:

> In Latin America, not everyone has access to adequate housing, especially low-income households. Traditionally, profit-seeking private real estate developers supplied houses for high- and middle-income households, with financing available from government-sponsored mortgage banks. . . . This system excluded the growing number of urban households. . . . Households unable to find housing in the formal markets resorted to informal solutions by either invading, or squatting on, land or purchasing illegally subdivided lots and building their houses incrementally.

In a market economy, poor people will always have poor housing and associated services because their incomes are low. But it is widely believed (and discussed in this chapter) that housing conditions for many in Latin America and elsewhere are even less satisfactory than can be explained by lower incomes. What are the sources of these market failures, and how can they be fixed?

The chapter's introduction reminds us that while there is variation within the region, in recent decades much of Latin America has shown marked improvement in many basic economic indicators. Inflation is down from the 1980s, real incomes have risen, and poverty rates have fallen. As Rojas shows strikingly in figure 10.2, as incomes rise, housing conditions improve. But there are also other ways to improve the functioning of housing markets along both efficiency and distributional lines. Rojas aims to show how better policies can further improve housing outcomes.

Rojas's categorization of the many housing programs and policies across the region helps to clarify the situation. It is simple yet more informative than the usual bifurcation between supply side (policies focused on housing units, or "bricks and mortar") and demand side (policies focused on subsidies or other interventions aimed at households). The supply side/demand side distinction remains front and center, but Rojas reminds us to consider existing as well as new housing, and rental as well as owner-occupied units. It has been argued elsewhere that demand-side subsidies (housing allowances or vouchers) are underutilized compared with public housing and other supply-side strategies (Malpezzi 2014; Mayo and Gross 1987).

As Rojas points out, countries such as Chile and Colombia have been leaders in this shift in focus from supply side to demand side (see also Ferguson, Rubinstein, and Dominguez Vial 1996). But he also notes that in far too many countries, an emphasis on the production of new housing has led to the neglect of problems related to existing stock. In even the fastest-growing countries, the existing stock provides the bulk of housing services. In discussing the bias toward owner-occupied housing to the exclusion of rental housing, Rojas emphasizes that the latter is an important market in most countries, especially among low-income households.

According to Rojas, the incentives driving cost-minimizing public housing agents are often different from those driving profit-maximizing private developers. All too often, public entities maximize the number of houses built by minimizing the financial cost of the land. This can create serious problems with respect to the location of new developments and therefore also with respect to transportation, employment, and public services. An online photo essay by Livia Corona Benjamin titled "Two Million Homes for Mexico" nicely complements Rojas's analysis in this regard (Corona Benjamin 2014).

Another theme of the chapter is that transportation and housing go hand in hand. This simple but powerful relationship has too often been neglected by researchers, although Mohan (1994) and Meyer et al. (1999) present cogent discussions on how the two are related.

Rojas asserts that the most effective solutions to the problem of rising land and housing prices usually revolve around increasing supply, and one of the most common constraints on supply is a lack of infrastructure. While I certainly agree with him, I suggest that reforming the tax and regulatory environment is also often central to improving the operation of the supply side. This topic could be expanded on in further research, drawing on, for example, Bertaud (2010) and Monkkonen and Ronconi (2013). "Incentives analysis" case studies along the lines suggested by Hannah et al. (1989) could help provide an integrated view of how infrastructure, tax, subsidy, and regulatory policies affect the supply of housing.

Another area for further research is exploring the relationship between "housing needs" and housing prices and rents. To economists, prices are the canaries in our coal mines, as close to a "sufficient statistic" as we are likely to find for the health of housing markets. This chapter gives us a taste of this relationship in table 10.6, which provides some price information for Buenos Aires, Bogotá, and Santiago. Researchers need to expand the available data, a task that will have to proceed on a country-by-country basis. These data must include not just the average price of new houses for some selected sample but also more finely grained information broken down by city and market segment (high-end, middle-class, and affordable housing), with more attention paid to controlling for quality differences across time and place.

The chapter includes a substantial discussion of urban sprawl and decreasing density. These issues are ubiquitous in growing cities worldwide, as discussed in

Angel (2012) and Malpezzi (2013). How much decentralization is "too much," and what are the welfare implications? Brueckner (2000) presents a nice framework for thinking about such questions. Arguably the biggest market failures in sprawl have occurred in cities such as Brasília, and to a lesser extent Curitiba, where planning and other regulations have been implemented in ways that create especially large distortions in land use. Bertaud (2010) and Bertaud and Malpezzi (forthcoming) compare these cities with Rio de Janeiro, Buenos Aires, and Mexico City; Ingram and Carroll (1981) analyze Bogotá and Cali. These latter cities, while not without their problems, exhibit a much more efficient urban form.

A deeper discussion of housing finance is another avenue for more research. Renaud (1999) and Buckley and Kalarickal (2006) are nice complements to the brief discussion in this chapter.

Rojas's survey of some of the main housing issues in Latin America can be applied to many other countries as well. In addition to the information provided in the text, his references are well worth exploring; I found a few gems that were new to me.

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11

The Relationship Between the Rise of Private Communities and Increasing Socioeconomic Stratification

Evan McKenzie

In 1991, Robert Reich argued that the rise of private communities represented the "secession of the successful." The "fortunate fifth" of the income distribution "have in effect withdrawn their dollars from the support of public spaces and institutions shared by all and dedicated the savings to their own private services." Private communities, he contended, "undertake work that financially strapped local governments can no longer afford to do well—maintaining roads, mending sidewalks, pruning trees, repairing street lights, cleaning swimming pools, paying for lifeguards and, notably, hiring security guards to protect life and property" (Reich 1991, 16). For Reich, there was a physical and institutional secession going on, and private communities were at the heart of that process.

Private communities, many featuring relatively high levels of security that distinguish them from their surroundings, have become a visible symbol of residential segregation by income. Although it is unclear exactly what the relationship between the rise in private communities and increasing social stratification is, numerous studies shed light on this complex relationship.

Certain facts are beyond serious dispute. From the early 1970s to the present, two trends have been well documented in metropolitan areas across the United States. The first is an increase in residential segregation by income and wealth in many parts of the nation. The second is an increase in income inequality. The growing gap between upper- and middle-income earners is the most dramatic aspect of that trend. It is widely believed that increasing income inequality is

Table 11.1
Increase in Private Communities, 1970–2012

Year	Number of Communities	Number of Housing Units (millions)	Number of Residents (millions)
1970	10,000	0.701	2.1
1980	36,000	3.6	9.6
1990	130,000	11.6	29.6
2000	222,500	17.8	45.2
2002	240,000	19.2	48.0
2004	260,000	20.8	51.8
2006	286,000	23.1	57.0
2008	300,800	24.1	59.5
2010	309,600	24.8	62.0
2012	323,600	25.9	63.4

Source: CAI (2014).

an important contributor to residential socioeconomic segregation. As people's economic fortunes diverge, their opportunities grow or shrink, and they find themselves living in different neighborhoods with different lifestyles. Research supports the existence of this relationship.

A third trend that may more fully explain the growing segregation by income and wealth is the rise in the number of common interest developments (CIDs). Most notable among these are new suburban and exurban subdivisions run by private homeowners' associations, and urban condominium and townhome developments. In 1970, there were only about 10,000 private communities in the United States, with an estimated population of 2.1 million. Today, there are nearly 324,000 communities, with more than 63 million residents (table 11.1).

Private communities offer developers a variety of tools that facilitate the segregation of people into neighborhoods with residents who have similar socioeconomic characteristics. These tools include private governments that offer a range of exclusive services and amenities to those who can afford them; master planning; targeted marketing strategies; and the enforcement of elaborate property-oriented rules by community associations.

This chapter explores the existing literature on the relationship between the spread of private communities and the trend toward residential segregation by income. It explains what CID housing is, provides an overview of major theoretical perspectives suggesting how and why people might become segregated by income, and discusses the evidence documenting increasing residential segregation by income since 1970. The chapter then considers possible explanations for or causes of that trend, including increasing income inequality, real estate develop-

ment practices, and CIDs themselves. It ends with a discussion of case studies, which are grouped into two categories: those concluding that CIDs contribute to residential segregation by income and those that found the opposite.

What Is Common Interest Development Housing?

Common interest development, or CID, housing is a form of residential real estate in which owners acquire two property interests. One is a common interest, or share in the "common elements" of the project, that links all owners together as co-owners of the real estate. The other is an individual interest, which the owner can call his or her own. All owners become mandatory members of a private association that either owns or manages the commonly owned property, and that association has quasi-governmental power over them.

There are three different ways to arrange CID housing: homeowners' associations, condominiums, and housing cooperatives. In *homeowners' associations*, the individual interest is typically a single-family home, and the common interest is the "common areas" of a planned subdivision, which might include private streets, water features, recreation centers, parks, private sewer and water systems, and other things that municipalities would otherwise provide. A private homeowners' association elected by the owners owns the common elements, collects assessments that are the equivalent of property taxes, and governs the subdivision.

Condominiums are a form of property ownership typically found in multifamily construction. The individual interest is just the space within each owner's apartment, which is called a unit. The entire physical building is owned in common by the unit owners and managed by the condominium association. Condominium units are sold individually, as if they were separate property interests. Many condominium documents state that the board has the right of first refusal when an owner wants to sell a unit, but this right is not often exercised because few associations have the means or the desire to purchase units.

In *housing cooperatives*, each owner has a corporate share interest in the building or buildings and a lease that grants him or her the exclusive right to occupy a particular unit. The governing board typically requires that potential new owners submit to an interview with the board, which has the power to deny permission for a sale without the cooperative being required to purchase the unit. The purpose of the interview is to determine whether the prospective purchaser would be a suitable addition to the cooperative. One critical factor is whether the purchaser can afford the unit, and screenings probably result in fewer foreclosures than in comparable condominiums (Stellin 2012). There is some evidence that this power to block a sale has on occasion been exercised to exclude racial and other groups that are protected by fair housing statutes (Maldonado and Rose 1996; Strahilevitz 2006). Income discrimination is not covered by fair housing laws, however. It is conceivable that the screening procedure could also contribute to greater income segregation than in condominiums, but no empirical

study directly comparing condominiums and cooperatives on this dimension came to light during this research.

All three forms of CID housing have common property ownership, private governing documents, and mandatory membership associations that function as private governments. Many also have some degree of master planning and some degree of security (McKenzie 2011).

The institutional features of CID housing can be conducive to creating segregated development patterns, if that is the developer's intent, but local governments and consumers also are involved. CIDs are created by real estate developers with the approval of local governments and have the potential to cater to a wide range of consumer preferences. Developers can, however, offer residents certain amenities, including security measures, that residents must pay for in addition to paying real estate taxes to the local government for similar services. This suggests that there are additional costs associated with living in private communities—costs that presumably only the relatively affluent can afford. In some places, local governments mandate that all new residential construction must be in private communities, seeking the tax windfall that will result from having residents pay taxes for public services and amenities they do not use (Siegel 2006). This might cut against the argument that such developments increase income segregation.

Theoretical Perspectives on Residential Segregation and Sorting

Segregation takes place in a social, political, and economic context that has been studied for decades. There are a number of well-known theoretical perspectives suggesting the likelihood that over time people are sorted into relatively homogeneous neighborhoods, with income being one of the factors that contributes to this sorting. Among the most relevant theories are Charles Tiebout's model of residential sorting (Tiebout 1956); Thomas Schelling's "tipping point" model (Schelling 1971); Anthony Downs's analysis of the "trickle down" dynamic in the housing market (Downs 1975); and the "homophily" literature, which focuses on the "birds of a feather" dynamic (McPherson, Smith-Lovin, and Cook 2001).

Based on theories of microeconomics, Tiebout's seminal article was a response to Paul Samuelson's theoretical demonstration that government decisions about taxing and spending for public goods always lead to overproduction, because there is no market mechanism operating in these decisions and therefore they are made with insufficient information about people's preferences (Samuelson 1954). Tiebout asserted that this would not hold true for local governments under a particular set of conditions. If the residents of a metropolitan area were viewed as mobile consumers with varying preferences who could "vote with their feet" without high transaction costs; if there were many municipalities offering different packages of services and different tax burdens; and if consumers had full information about the differences, a residential sorting process could take

place that would produce a sort of equilibrium and efficiency. Consumers would be able to maximize their own preferences (Tiebout 1956).

Tiebout's model has been influential among academic advocates of CID housing because they believe that private communities are even better participants in this process than municipalities. Private organizations are free of constitutional restraints and are created by contract, so they can offer a greater range of choices. Presumably, this could lead to greater efficiency and satisfaction (Nelson 2005). To the extent that people have a preference for living with others of similar income and socioeconomic status, developers could offer communities that meet that preference. As economist Tara Watson has observed, "The simplest form of the Tiebout model implies that residential segregation by income should be complete" (Watson 2009, 822).

Game theorist Thomas Schelling developed a "checkerboard" or "tipping point" model demonstrating how relatively small differences in individual preferences for neighborhood composition could lead to rapid segregation (Schelling 1971). Once a sorting process based on a salient characteristic begins, he argued, it will accelerate until total or near-total segregation results. That is, when residents with the greatest preference for homogeneity move in response to diversity in their neighborhood, the neighborhood becomes more diverse, which triggers those with the next-greatest preference for homogeneity to move, and so on. While this model is most often used in the context of racial segregation, it could apply to income segregation as well, with similar results.

In the 1970s, economist Anthony Downs described a "filtering" or "trickle down" process that leads to economic segregation, especially in the context of suburbanization. He argued that "nearly all new housing units in the United States . . . are too expensive for low- and moderate-income households to occupy—and even for many middle-income households. There is nothing 'natural' about this condition. Rather it results from legally preventing landowners from building whatever types of new dwelling units they desire on their land. But it has profound consequences for the entire urban development process" (Downs 1975, 3). New neighborhoods, he observed, typically comprise a cluster of similar houses, which are priced the same and built by a single developer or group of developers, and aimed at one target market. This housing, he wrote, "is initially occupied by households in the upper half of the national income distribution, because lower income households cannot afford to live there" (3). Over time, however, these houses become older, less fashionable, and less desirable; the occupants who are most economically successful move out; and the neighborhood becomes occupied by less affluent people. Then deterioration sets in, and eventually the neighborhood "trickles down" to "the lowest income groups in society and falls into extreme disrepair" (4).

Twenty years later, Downs referred to a "self-reinforcing hierarchy" among suburbs that is facilitated by fragmented government and suburban separatism. The hierarchy contributes to "an increasing geographic separation of socioeconomic groups" (Downs 1994, 47).

> To the extent that each suburban income group segregates itself from others with notably lower incomes, it creates a hierarchy based on income levels; high-income households cluster in high-prestige areas, middle-income in middling-prestige areas, and so forth. But low-income households are compelled to gather in low-prestige areas because they cannot afford any alternatives. This produces neighborhood conditions reasonably congenial to all except the poorest. Of course, there is some heterogeneity in all communities, but such a socioeconomic hierarchy exists in most metropolitan areas. At the top are a few high-prestige communities with expensive homes; at the bottom are a larger number of low-prestige communities of often deteriorated housing in the central cities or close-in suburbs. (22)

Sociologists have developed a theory that is relevant to residential sorting by income and other characteristics. Homophily is the tendency for "birds of a feather" to flock together. "Since people generally only have significant contact with others like themselves, any quality tends to become localized in sociodemographic space. . . . Homophily is the principle that a contact among similar people occurs at a higher rate than among dissimilar people" (McPherson, Smith-Lovin, and Cook 2001, 415–416). The social dynamic of homophily suggests that people would prefer to live and socialize with other people of similar socioeconomic status. If it is true that CID housing facilitates sorting by income, that would allow for easier operation of homophily.

Increasing Residential Segregation by Income

The theories outlined in the previous section suggest that long before the spread of CID housing, there were forces at work that could facilitate residential sorting by income. It has been well documented that there has been a significant increase in residential segregation by income in the United States since the 1970s. Many studies have focused on the period from 1980 on (Fischer 2003; Fry and Taylor 2012; Massey 1996; Massey, Rothwell, and Domina 2009). Typically, these studies have used census data at the tract or block group level, and their results have varied depending on the data source, the way the income distribution was sliced, and the statistical measure of segregation used.

According to Rey and Folch (2011), several indices have been used to evaluate these data, including the dissimilarity index, which is more often used to measure racial segregation; Jargowsky's neighborhood sorting index (Jargowsky 1995); and Watson's Centile Gap Index, or CGI (Watson 2009). The dissimilarity index shows the relative segregation of groups in neighborhoods or other subunits of a larger area such as a city or metropolitan area. The neighborhood sorting index is better adapted to income segregation, as it is expressed as the square root of the ratio of the income variance between tract income to the total variance in income of the larger area. The CGI "estimates how far the average family income within a tract deviates in percentile terms from the median family

income in the tract, compared to how far it would deviate under perfect integration" (Watson 2006, 14). In a metropolitan area that was completely integrated by income, every census tract would contain the entire income distribution, and it would have a CGI of 0. A city consisting entirely of economically homogeneous neighborhoods segregated by income, in which every neighborhood contained only one income level, would have a CGI of 1.0.

However segregation is measured, the consensus is that in recent decades, Americans have become increasingly segregated by income. According to one major study, "Residential segregation by income has increased during the past three decades across the United States and in 27 of the nation's 30 largest major metropolitan areas," with 28 percent of lower-income households being located in majority lower-income census tracts, and 18 percent of upper-income households being located in majority upper-income tracts in 2010. The corresponding figures for 1980 were 23 percent and 9 percent, respectively (Fry and Taylor 2012).

Another large-scale study focusing on the decline of middle-income neighborhoods concluded:

> Middle-income neighborhoods as a proportion of all metropolitan neighborhoods declined from 58 percent in 1970 to 41 percent in 2000. . . . Between 1970 and 2000, lower-income families became more likely to live in lower-income neighborhoods, and higher-income families in higher-income neighborhoods. Only 37 percent of lower-income families lived in middle-income neighborhoods in 2000, down from 55 percent in 1970. The proportion of neighborhoods that were middle-income shrank faster than the proportion of families that were middle-income in each of 12 large metropolitan areas examined. . . . Only 23 percent of central-city neighborhoods in the 12 large metropolitan areas had a middle-income profile in 2000, down from 45 percent in 1970. (Booza, Cutsinger, and Galster 2006, 1)

Jargowsky (1995) found that although economic segregation increased during the 1970s and 1980s for whites, blacks, and Hispanics, it increased more for blacks and Hispanics than for whites during the 1980s. Massey, Rothwell, and Domina (2009, 74) found that "during the last third of the twentieth century, the United States moved toward a new regime of residential segregation characterized by moderating racial-ethnic segregation and rising class segregation," and they emphasized that segregation today may be less the result of prejudice and actual discrimination, and more the result of land use decisions.

Comparing 1970 and 2009, Reardon and Bischoff (2011, 1) found that

> mixed income neighborhoods have grown rarer, while affluent and poor neighborhoods have grown much more common. In fact, the share of the population in large and moderate-sized metropolitan areas who live in the poorest and most affluent neighborhoods has more than doubled since 1970, while the share of families living in middle-income neighborhoods

> dropped from 65 percent to 44 percent. The residential isolation of both poor and affluent families has grown over the last four decades, though affluent families have been generally more residentially isolated than poor families during this period.

It is clear from the literature that Americans are increasingly living in economically homogeneous neighborhoods. This may be a dangerous trend because the characteristics and behaviors of neighbors and schoolmates impact children's chances for success in school and in the economy. It also may be true that this form of residential sorting increases the likelihood of spatial mismatches between affordable housing for the poor and the jobs they can hope to find. Moreover, neighborhoods with concentrated poverty may have lower-quality schools and public services, as spatial separation of the affluent and the poor may contribute to declining political support for public services upon which poor people depend (Watson 2007).

Rising Income Inequality and Income Segregation

Those seeking to explain rising income segregation in the United States tend to identify increasing income inequality as a leading cause. Income inequality is generally measured using the Gini coefficient. This coefficient is based on the Lorenz curve, which plots on its x-axis the cumulative percentage of a nation's population, and on its y-axis the cumulative share of the income earned by each percentage of the population. The lower the Gini coefficient is, the greater the nation's income equality; the higher the Gini coefficient, the greater the inequality. A Gini coefficient of 0 equals perfect equality of income, with every member of the population having the same income, and a coefficient of 1 equals perfect inequality, with one person receiving all the nation's income and the rest of the population receiving none.

Between 1967 and 2012, the Gini coefficient for all U.S. households rose from 0.397 to 0.477 (U.S. Census Bureau 2014b). The level of income inequality in the United States is among the highest of the 34 nations that belong to the Organisation for Economic Co-operation and Development (OECD), an organization consisting of nations with developed market economies and systems of representative democracy. The increase in the United States started earlier and has been greater than in nearly all the OECD nations, although there is also a broader trend toward rising income inequality among these nations. As one OECD report notes,

> [Income inequality] first started to increase in the late 1970s and early 1980s in some English-speaking countries, notably the United Kingdom and the United States, but also in Israel. From the late 1980s, the increase in income inequality became more widespread. The latest trends in the 2000s showed a widening gap between rich and poor not only in some of the already high inequality countries like Israel and the United States, but

> also—for the first time—in traditionally low-inequality countries, such as Germany, Denmark, and Sweden (and other Nordic countries), where inequality grew more than anywhere else in the 2000s. (OECD 2011, 22)

This change can be quantified with U.S. households divided into quintiles. In 1967, the poorest one-fifth of the population earned 4 percent of the national aggregate income, and the wealthiest one-fifth earned 17.2 percent. By 2012, the poorest one-fifth took home only 3.2 percent of the aggregate income, and the top one-fifth earned 22.3 percent (U.S. Census Bureau 2104a).

The rise in income inequality, its causes, and its consequences have recently become the subject of considerable academic and political discussion. Doing justice to that literature is beyond the scope of this chapter. However, some findings have special relevance to the relationship between rising income inequality and increasing segregation by income.

There are different ways that income inequality can increase. For example, those at the bottom of the income distribution could fall further behind, those at the top could race further ahead, or both top and bottom could move further from the middle. In the United States, the most significant trend seems to be a shift in income in favor of those at the top. According to Watson (2007, 2), "Between 1973 and 2000, the inflation-adjusted income of the bottom one-fifth of American families rose by about 12 percent, while that of the top one-fifth grew by about 67 percent."

The most significant increases in income inequality are not within the top 20 percent, however, but the top 1 percent. Economist Emmanuel Saez analyzed income data from 1917 to 2012 and found that the top percentile has outpaced the rest.

> Interestingly, the income composition pattern at the very top has changed considerably over the century. The share of wage and salary income has increased sharply from the 1920s to the present, and especially since the 1970s. Therefore, a significant fraction of the surge in top incomes since 1970 is due to an explosion of top wages and salaries. Indeed, estimates based purely on wages and salaries show that the share of total wages and salaries earned by the top 1 percent [of wage earners] has jumped from 5.1 percent in 1970 to 12.4 percent in 2007. (Saez 2013, 5)

It seems clear that the rise in U.S. income inequality has been driven largely by an increasing income share in the top 1 percent of the income distribution (Saez 2010). Several macro-level causes of this shift have been suggested. Globalization has brought with it changing demands for labor that markedly favor better-educated and higher-skilled workers. Technological transformations have contributed in the sense that an economy that relies heavily on increasingly sophisticated information technology favors those with higher skill levels. And in the United States and elsewhere, the years since 1980 have brought public policies and economic transformations concerning taxation, unions, part-time work,

deindustrialization, pensions, healthcare, bankruptcy, and other aspects of life that may benefit top income earners over others. The interactions among these variables are complex, however, and there are some aspects of these changes that have *reduced* inequality in some places (OECD 2011, 24).

Real Estate Development Practices and Income Segregation

Certain features of the housing market also appear to be related to income segregation. Watson examined that relationship and found that "growing income inequality within a metropolitan area changes the residential location of rich and poor families in ways that cause neighborhoods to become more segregated by income" (Watson 2007, 2).

The overall increase in income inequality in the United States varies among regions, states, and metropolitan areas. Watson explored these variations. While finding "rapidly growing segregation by income," she also showed that there were major differences among the nation's metropolitan areas in the nature of income segregation and that they could be sorted into four categories based on population growth and economic growth from 1960 to 2000. "Distressed" areas were in the bottom one-third of metro areas in both types of growth. "Non-distressed" areas included those that were "supply-constrained," with strong economic growth and housing price increases that exceeded population growth. "Rapidly growing" areas were in the top third of population growth, and "other non-distressed" areas had moderate growth and some degree of distress (Watson 2007). Although both distressed and non-distressed areas experienced rapid growth in income segregation, Watson found that in distressed areas, greater income segregation was associated with excess housing construction, or overbuilding.

Watson's analysis began with the Tiebout model. If it is simply assumed that all households have the same preferences for neighborhood characteristics—good schools, low crime, scenic views, and so forth—and that some neighborhoods are more desirable than others with respect to those characteristics, then income segregation would occur because the wealthy could outbid the less affluent to live in the better neighborhoods. The poor would be priced out of the better neighborhoods. Moreover, "as inequality increases, it becomes less likely that rich and poor households are willing to pay similar amounts to live in a given neighborhood. In this sense, income inequality is a primary determinant of the market pressure for segregation. In addition, the income distribution may affect residential sorting by differentially changing neighborhood quality and thereby changing the relative price of a high-quality neighborhood" (Watson 2006, 5).

Watson argues that income inequality leads to overbuilding, which in turn contributes to rising income segregation. She models the relationship this way:

> Rising income inequality creates pressure for income sorting in residential markets. In rapidly growing metropolitan areas, changing preferences are rapidly reflected in the housing stock and in the level of segregation. In

> slowly growing metropolitan areas, however, the housing stock reflects the preferences of previous generations of residents. If existing housing costs less than the price of new construction or retrofitting (which may be the case in severely depressed areas), there is little incentive for construction or renovation. Rising segregation occurs in slow growth areas only if the change in market pressure for segregation is sufficient to overcome the costs of retrofitting or new construction. A key feature of the model is that changes to the housing stock are necessary to allow the resorting of income groups. (Watson 2006, 3)

What happens in rapidly growing areas is especially relevant to understanding the role of CID housing as a contributor to income segregation. CID housing is a large and increasing share of the new housing stock. In locations that are growing rapidly, a great deal of the suburban housing growth is in planned developments with homeowners' associations; in redeveloping urban areas, new condominium and townhome developments are the norm. If there is overbuilding in these areas, it is an overbuilding of CID housing. Watson found that "booming new construction is expected in places with rapid employment and population growth, such as Las Vegas and Tucson. . . . New housing is constructed to respond to the influx of new residents. If income inequality is rising as the metropolitan area is built, new neighborhoods will tend to be homogeneous, reflecting market pressures for segregation by income" (Watson 2007, 3).

In distressed metro areas such as Detroit, where there is little population or economic growth, Watson found that "land prices are low, making it relatively inexpensive to build new housing. Therefore, when the rich want to segregate themselves from the poor, they move into new high-income neighborhoods. . . . Market pressure for income segregation leads to new housing construction in excess of what would be expected given population growth alone" (Watson 2007, 3). According to Watson, this overbuilding of new urban housing, which largely comprises condominiums and other CIDs, can accelerate neighborhood decline.

Common Interest Housing Characteristics and Income Segregation

Clearly, housing industry practices are related in complex ways to income segregation. But how can the impact of CID housing be isolated from the many other factors involved, such as volume, location, and pricing? Put differently, what is the significance of the fact that CID housing has accounted for much of the new construction since about 1980? CIDs have certain characteristics that could contribute to residential segregation by income and wealth. Two of the most significant are the use of master planning and targeted marketing to build and sell homes in subdivisions that cater to narrow slices of the income distribution and particular household types, and the use of security features to create so-called gated communities.

MASTER PLANNING AND TARGETED MARKETING

Before the rise of CID housing, many residential neighborhoods were constructed with comparatively little planning. Municipalities laid out streets, ran utility lines, set up zoning and building codes, and issued building permits. Housing was then constructed either by home builders, who sold them to the public, or by homeowners, who bought lots and plans and hired contractors to build homes for them. Neighborhoods grew up in a relatively organic fashion, with different housing types, sizes, color schemes, and other features chosen by owners in accordance with their preferences. By contrast, CIDs always involve some degree of master planning. Typically, the plan involves multiple construction phases, a set of housing plans that owners can choose from, a set of price ranges for each type of home, a color palette, and detailed arrangements for paying for private amenities and utilities. Thought is given to how people will live in the development, where they will play, how they will meet one another, and above all who they will be. In other words, CID housing is typically marketed to particular demographic groups, based on careful consideration of their socioeconomic characteristics.

CID housing has been a preferred tool for large-scale residential developers since the 1970s, and leading industry publications continue to explain how to set up homeowners' associations as a critical part of the development process. These associations, the publications explain, are part of the marketing process and are essential to long-term governance of the project. The publications also emphasize the importance of understanding the income ranges of the "target market" and show how to focus on increasingly smaller "niches" of the market. Associations have become the enforcement tool for making sure that a developer's vision is carried forward and the project looks and functions as it was set up. In this way, associations are intended in part to maintain whatever segregation by income, household type, or other characteristics the developer originally put in place during the marketing phase.

The Urban Land Institute is the leading educational and research organization in the real estate development field. Its *Residential Development Handbook*, first published in 1978, has long been widely used by developers. The 1990 revision of the handbook emphasizes the importance of understanding the income ranges in the target market in order to set prices at exactly the right levels.

> An analysis of median household income within the target market area indicates the economic welfare of the region and provides valuable insight into the scope and magnitude of the available purchasing power for housing. . . . This part of the analysis involves tracking historic changes and projections in median and average household income for the primary, intermediate, and regional target market areas, including the rate at which incomes rise and the number of households in each income bracket. . . . Such information is invaluable in determining a range of prices that a significant portion of the population can afford. . . . In residential development, income of consumers is a most important factor in demand. As incomes rise, people generally demand and can pay for larger, customized

> houses in neighborhoods with more amenities. (Urban Land Institute 1990, 22–23)

That year's handbook also documents the trend that began in the 1980s toward increasingly specialized niche markets.

> A trend that developed during the 1980s and is expected to continue into the 1990s is the specialization of housing products designed for very specific markets (often referred to as "niche markets"). Such niches include houses for first-time buyers, "move up" houses for second- or third-time buyers, housing for the elderly, housing for low- and moderate-income households, and second-home or resort-oriented products. . . . In the years ahead, designing for particular market niches is likely to become much more complex. (166)

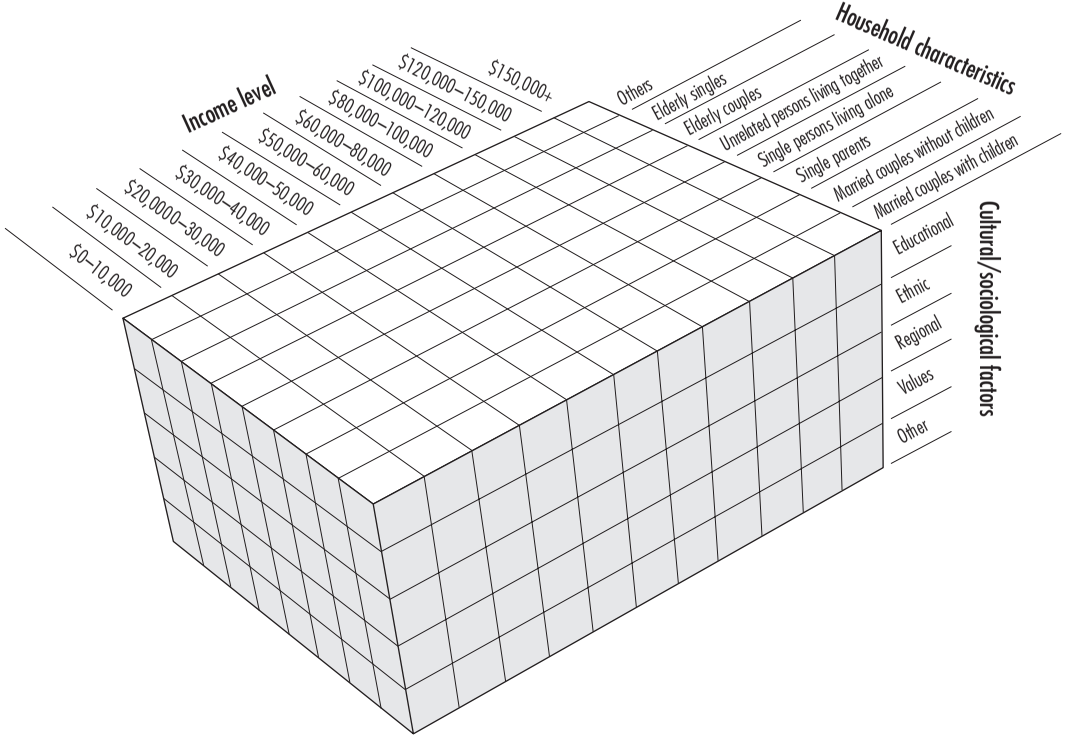
Looking into the future in 1990, the Urban Land Institute anticipated increasingly sophisticated targeting of potential buyers, using characteristics such as income range to market a neighborhood precisely to a clearly defined demographic.

> During the 1990s and beyond, residential markets will become increasingly segmented. In the past, developers targeted their products to market niches based on a two-dimensional matrix—one matrix consisting of income levels and the other consisting of household characteristics. In the future, however, consideration of a third matrix accounting for diverse sociological and cultural characteristics will also need to be considered. The number of "cells" or market niches is thus increased dramatically. Successful marketing will require careful targeting to specific cells within the matrix. (370)

The 1990 handbook includes a three-dimensional matrix (figure 11.1) in which one axis depicts eleven different income levels; a second depicts eight household characteristics, such as "married couples with children" and "elderly singles"; and a third depicts cultural/sociological factors, including the categories "educational," "ethnic," "regional," "values," and "other" (370).

In the 2004 handbook, the emphasis on research into income ranges in the area of the planned development was renewed. "Demographic trends and projections form the basis for determining the demand for housing. Four demographic factors are of primary importance in analyzing the market potential for a project: employment, population, households, and income" (Urban Land Institute 2004, 42). The handbook explains why developments must be targeted to specific characteristics of the area, emphasizing the essential nature of real estate: "Real estate is different from other consumer products in that it cannot be moved to the consumer: the consumer must move to the product. Location is real estate's primary characteristic. Most projects must be custom tailored to the local market and cannot be mass produced for all markets. Because housing markets are so

Figure 11.1
Real Estate Market Segmentation



Source: Urban Land Institute (1990, 370).

localized, the demographic data must be for the local area" (Urban Land Institute 2004, 43).

Each version of the handbook contains a chapter on "community governance," which discusses creating a community association. The Urban Land Institute has been a strong advocate for creating such associations since the early 1960s, when it published the first handbook for creating homeowners' associations (Urban Land Institute 1964). The institute's 1990 handbook presents associations as part of the "stewardship of the land," explaining,

> A more formal mechanism for the maintenance of the development is the creation of an organization that can assume responsibility for governance, maintenance, and provision of services necessary to the development. Such organizations are generally grouped under the category of "community associations." . . . The association forms the basis of governance that preserves the architectural integrity, maintains the common open space, and protects the development's property values. (Urban Land Institute 1990, 289)

According to that year's handbook, the association is a selling point to be used in marketing the project to its intended niche. "A well-conceived program for community governance and maintenance can be a strong selling feature for a new residential community. Prospective property owners will be interested in preserving the quality of the neighborhood while they live there and in the potential appreciation of property values that can accrue to a well-planned and well-maintained community" (290). The heavy emphasis on creating associations continued through the 2004 edition: "Governance is frequently the last thing a developer wants to consider or spend time addressing; in many ways, however, governance is one of the most important parts of project planning and execution" (Urban Land Institute 2004, 185).

According to the Urban Land Institute, the association's enforcement functions are central to maintaining a project's unique characteristics. "It should be recognized that if a residential development is to have a distinctive quality and character, it is highly likely that at least one or more special protective covenants will be needed to assist in the preservation and maintenance of its special characteristics. If reasonably and diligently enforced, CC&Rs [covenants, conditions, and restrictions] are in many ways stronger and more effective than zoning or other publicly enforced land use controls" (Urban Land Institute 1990, 299). The handbook goes on to explain:

> Unless adequate machinery is set up initially for proper enforcement, covenants may become ineffective through nonobservance and conscious violation. CC&Rs are typically enforced by the community association, although they can also be enforced by private individuals. Enforcement of suitable CC&Rs assures each owner that no other owner within the development can use property in a way that will destroy values, change the character of the neighborhood, or create a nuisance. Strict enforcement of

> the CC&Rs, however, can best be assured by the creation of a viable community association. (300)

This advice is carefully phrased to portray strict covenant enforcement as a universal, uncontroversial public good. However, the handbook's suggested list of "typical items subject to use restrictions"—that is, things that the CC&Rs would prohibit and the association would enforce—includes behaviors that connote issues of social class. The association is tasked with enforcing guidelines based on the aesthetic tastes of upper-income groups. For example, "prohibited activities and objects" include parking "boats, trailers, motor homes, or vehicles being repaired" in front of the house; clotheslines; visible outdoor and garage storage of building materials and maintenance equipment; operating a business from the home; and "excessive ornamentation." ("Driftwood, statues, animal skulls, wagon wheels, windmills, etc., in areas visible to your neighbors are not allowed") (301).

Examination of publications such as the Urban Land Institute's handbooks suggests that CID housing reflects a vast housing industry consensus that residential developments should be targeted to very specific segments of the population. Income is one of the most crucial components of that segmentation. The effort to achieve market segmentation includes enforcing in perpetuity a set of governing documents that are aimed primarily at protecting property values. This approach, however, is based on the assumption that property values are enhanced by architectural sameness and the prohibition of certain behaviors often associated with lower social classes.

Recalling Anthony Downs's explanation of how housing "trickles down" the income distribution, it appears that in CID housing, the industry has found a way to counter the forces involved in that process. On the whole, CIDs do not tend to descend down the income distribution. And to the extent that a given CID began its life as a homogeneous neighborhood that was marketed to a small slice of the income distribution and a particular household type, it would tend to stay that way. This could be seen as contributing to long-term neighborhood homogeneity.

SECURITY FEATURES: GATED COMMUNITIES AND THE SEARCH FOR SECURITY THROUGH SEPARATION

Virtually all gated communities are CIDs, and for that reason the entire conversation about gated communities can be viewed as representative of the larger conversation about privately governed residential communities. Gated communities are hard to define precisely, because many, if not most, CIDs have some private security features, and deciding at what point the "gated community" label applies is somewhat arbitrary. There are three main types of security offered: entry controls, such as gates and guardhouses (with or without guards); hardened perimeters, including fences, walls, and natural barriers such as water features; and internal surveillance, such as video cameras, roving security personnel, and neighborhood watch volunteers.

Blakely and Snyder (1997) define gated communities as "residential areas with restricted access in which normally public spaces are privatized. They are security developments with designated perimeters, usually walls or fences, and controlled entrances that are intended to prevent penetration by nonresidents" (2). These authors contend that gated communities should be viewed as part of an effort by upper-income Americans to separate themselves from the poor and other perceived negative conditions of urban American life. Gated communities, they argue, are visible symbols of a campaign for separation that includes other tools as well. "Gates, fences, and private security guards, like exclusionary land-use policies, development regulations, and an assortment of other planning tools, are means of control, used to restrict or limit access to residential, commercial, and public spaces" (2). They "exist to wall out crime or traffic or strangers as well as to lock in economic position. Greater control over the neighborhood is presumed to mean greater stability in property values" (154). The authors argue that the boom in gating that occurred in the 1980s and 1990s was a response to increasing diversity, particularly in suburbia. At that time, it became clear that

> poverty and economic inequality are no longer limited to the inner cities. . . . Flight to the suburbs has not meant avoiding all the aspects of poverty associated with the urban core. The Los Angeles area is the new archetype of metropolitan spatial segregation, in which poverty is no longer concentrated in the central city but is suburbanizing, racing farther and farther out from the metropolitan center. The demand for gates and walls is created and encouraged by these new social changes. (145)

Case Studies of Private Communities

The literature on private communities, with or without security features, includes a large number of case studies. Some focus on particular subdivisions, while others deal with part or all of a metropolitan area. Many of these studies are part of a growing international literature that examines urban and suburban areas in Europe, Asia, Africa, Australia, New Zealand, and the Americas. These studies almost always use the term *gated community*, which is useful in that it provides a rubric under which many scholars can share their research. However, it is not sufficiently precise for social scientific studies.

The word *gated* is used to characterize many different types and levels of security: residential neighborhoods of single-family homes with walls and real gates that are opened and closed by security personnel; electronically controlled entry systems with gates that open or arms that go up and down; places that have a perpetually empty guardhouse at the entrance but no actual physical barrier; urban condominium buildings with card-key access or doormen; and all sorts of other variations on the theme of private residential security. The word *community* is one of the most imprecise terms in the social sciences. It can be used in everything from the oxymoron "international community" to a planned

subdivision or condominium building, or even to a single census tract or block group.

When the two words are put together, especially when they are used in different national contexts, the new term can mean a number of different things. On balance, however, there is more to be gained by grouping these studies under the *gated community* rubric than would be lost by trying to come up with another term.

Common themes among studies of CIDs include the design and marketing of projects and the segregative nature or impact of the developments; segregation by income or class in different social contexts; and the physical, "gated" nature of developments, which seems a novelty in some countries. Many scholars focus on the last concept in their own national contexts, in some cases not examining the institutional elements as closely as perhaps they should. Property laws also vary across cultures, which can make international comparisons of gated communities difficult. However, in general there are enough similarities that these international authors regard themselves as being engaged in writing about the same basic phenomenon, and they publish in the same journals and meet in specialized conferences to present their research.

Case studies of gated communities can be grouped into two broad categories: those concluding that these communities contribute to residential segregation by income, and those concluding that they do not contribute to such segregation. Most of the studies highlight the segregative attributes and impacts of private communities. Other studies argue that the impacts of private communities are more complicated and that in some ways these communities make it possible for upper-income people to live in closer proximity to those of lesser means.

STUDIES CONCLUDING THAT PRIVATE COMMUNITIES CONTRIBUTE TO INCOME SEGREGATION

There is no shortage of studies of private communities, both gated and non-gated, that claim to demonstrate the communities' potential for creating income segregation, and in many cases their substantial contribution to segregating cities and suburbs by income or class. In a widely cited study of approximately one thousand gated communities in the United Kingdom, Atkinson and Flint (2004) concluded:

> Gated communities [GCs] provide a refuge that is attached to social networks, leisure, schooling and the workplace via paths which are used to avoid unwanted social contact. Our argument is that each of these spaces more or less segregates its occupants from social contact with different social groups, leading us to suggest that the impact of such residential division resembles a seam of partition running spatially and temporally through cities, what we term time-space trajectories of segregation. (877)

These authors conducted interviews with residents and officials and found concerns about the communities' segregative effects that go beyond income.

> Many expressed concern that GCs were not adequately integrated, physically or socially, into the local area. As one planning officer put it: "Gated communities are separated and isolated from the rest of the community. They are clearly not part of the fabric of their local areas." The case study GCs were viewed as exclusive, both by residents within the developments, and by the residents of surrounding neighbourhoods, who largely viewed the residents of the gated communities, in the word of the Chair of one local residents' association, as "those people behind the gates." This lack of integration was partly the result of the exclusive nature of the gated communities, and this distinction, in the view of many respondents, was deliberately generated by both developers and the residents of the communities. (884)

Interestingly, the authors noted that residents of gated communities were generally supportive of this perspective, citing lack of contact with, and disengagement from, their neighborhood surroundings.

Atkinson and Flint ultimately characterized gated communities as "secessionary spaces" (889). But they also acknowledged that the picture is more complex than this.

> Arguably gated communities and current urban policy seek similar ends, namely the promotion of the city as a place to live for the middle classes. In this the small scale and number of GCs helps in a case for their immunity from wider planning frameworks. It is possible to argue that they cater for an elite fraction who need security by virtue of their status and that security is a right to which freedom of choice should be ascribed. However, our case studies suggest that GCs range from off-street fiatted units in small northern towns to feudal fortresses on huge sites implying a much wider market appeal and that a wider demographic is seeking this kind of spatial withdrawal. (890)

Blinnikov and colleagues (2006) studied the spread of gated communities in the suburbs of Moscow. They found 260 private communities, most of them having security features such as gates and walls, and concluded that these communities showed significant income segregation.

> It is clear with the average asking price for homes in the neighbourhood of $300,000 in 2004 (prices have risen 30–40 percent in 2005) and an average household income (family of three) in Moscow in July of 2004 of about $24,000 per year, that it would require more than an average salary to afford any suburban detached housing. In fact, only so-called "very rich" and "simply rich" . . . would be able to afford such individual homes ("cottages"). Some in the "upper middle class" will be able to afford condos and newer, larger apartments in the city, but not individual houses in any of the developments discussed here. (76)

These authors also stress the significance of the privatized infrastructure and services as one aspect of this form of segregation.

> Most of them exist as self-contained gated enclaves with complete infrastructure to promote U.S.-inspired car-oriented commuter lifestyle quite disconnected from the reality outside the secured and gated perimeter. . . . Many such developments now begin to include schools and churches in addition to shops and gyms suggesting that the long-term occupation by families is the desired goal. This ensures that the current pattern of increasing segregation based on income and relational capital will continue to be perpetuated well into the middle of this century, just as the last wild patches of suburban Moscow forest succumb to another successful experiment in creating [a] socially fragmented consumer society. (80)

Almatarneh and Mansour (2012) studied the marketing of gated communities in Cairo, Egypt. In looking at this form of housing in an international context, they observed that although private communities were originally intended for high-income buyers, in recent years they have been aimed at middle-income groups as well. In Cairo, they found that these communities were marketed to young families "who shared the same socio-economic status. Thus, affluence, health, vitality, and age were uniformly portrayed" (514). These authors see private communities and their marketing as part of a "global culture of consumption" in which "exclusivity, prestige, privacy, shared identity, privilege, homogeneity, companionship, luxury, and security . . . [are] achieved through gates and walls" (515). In the Cairo housing market, they write,

> gated communities are offered as a modern urban alternative lifestyle that provide[s] privileged living spaces for individuals in the upper and upper-middle classes of the social hierarchy in terms of their economic and cultural capital. As such, these developments are promoted as homogeneous places in comparison to the heterogeneity of the open city. The fact that gated communities offer privileges to a certain segment of the society is often criticized because it causes separation in the spatial and social structure of the city. However, our findings indicate that developers of gated communities establish their marketing strategies based on exactly this factor, thus marketing the gated communities under the claim that they offer "a privileged exclusive lifestyle." (526)

Renaud Le Goix (2005) and Elena Vesselinov (2008) have separately studied the impact of private communities on segregation and found evidence of an effect. In 2013, they undertook together an empirical study of Southern California gated communities, comparing them with similar non-gated tracts (Le Goix and Vesselinov 2013). They found a complicated relationship between gating and property values.

> First, GCs are very heterogeneous and diverse in kind, ranging from average standardized products for the middle class to high-end coastal

> communities. It is significant that gated communities were more likely than non-gated communities to have experienced either "recent depreciation" in the wake of the foreclosure crisis, or "constant growth." But on average, the wealthier the area, the more GCs contributed to fuelling price growth, as these GCs offer better rent-gap opportunities and are situated in more desired locations in metropolitan areas. There is a significant correlation between gating and securing a neighborhood and price growth trends at the census tract level. (2141)

When comparing gated and non-gated neighborhoods, they found that gated communities contribute to housing price inequality: "GCs are more likely to be found in local contexts that introduce greater heterogeneity and instability in price patterns, thereby contributing to a local increase in price inequality that destabilizes price patterns at [the] neighborhood level, compared with non-gated communities" (2144). A number of factors were involved here. For example, they found that creation of a gated neighborhood causes a spillover of crime into nearby neighborhoods.

Ultimately, Le Goix and Vesselinov concluded that gating CIDs enhances their segregative effects.

> Gated communities are more likely to generate inequalities than non-gated CIDs, and are indeed more likely to produce a filtering of residents, which has a profound impact on segregation patterns. The dynamics of prices in gated communities show that homeowners are more likely to profit from price bubble periods, and more likely to resist a sudden drop in value during downturns, such as the foreclosure crisis, at the same time contributing not only status and "snob value" but also providing a means to differentiate themselves from others economically. . . . Price premiums for GCs are detrimental to property values in nearby non-gated developments and demonstrate a long-standing hypothesis about the unfavorable effects of gated communities on the value of properties located outside GCs' walls. (2146)

Other studies finding or suggesting that private communities promote some type of income or class segregation include Caldeira (2001); Dinzey-Flores (2013); Graves (2010); Kovács and Hegedüs (2014); Low (2001); Marcuse (1997); Roitman (2005); Schill and Wachter (1995); Smigiel (2013); Vesselinov (2008, 2012); Vesselinov, Cazessus, and Falk (2007); and Vesselinov and Le Goix (2009).

STUDIES CONCLUDING THAT PRIVATE COMMUNITIES DO NOT CONTRIBUTE TO INCOME SEGREGATION

A number of empirical and theoretical studies have offered a very different view of the relationship between private communities, both gated and non-gated, and income segregation.

Csefalvay and Webster (2012, 294) ask why there are so many gated communities in some countries and none in others. "If gated communities constitute

a successful model, why have they become a widespread global phenomenon only in the last few decades and why are they missing in the majority of European countries?" They acknowledge the most common explanations—fear of crime, rising individualism, growing social and economic polarization—but then go on to argue that the rise of gated communities may be a response to a demand for a way to escape from centralized city government decision making that is inefficient and overly regulatory. They argue that gated communities offer residents the ability to share club goods and thus more efficiently satisfy their preferences, while conceding that this explanation alone is also insufficient.

These authors explain that gated communities have a more complex relationship with income segregation than is often acknowledged.

> Residents of gated communities are . . . taxed twice for civic goods—once by the local municipalities and again through residents' contributions to their own micro-government. The affluent classes find this easy to cope with, although the fees for lower-income gated developments will tend to reflect residents' willingness to pay for shared goods and services—which are more basic. Club developments tend, therefore, to foster housing market segregation, but often at a finer spatial scale than found in conventional open neighbourhoods. This may yield positive social and economic benefits as income groups can live spatially closer than in the typical city where they are segregated by distance rather than by membership and gates. (296)

Gordon (2004) presents a careful empirical analysis of the contribution of planned residential developments with community associations to racial and income segregation in California. Based on 1990 U.S. Census and real estate data, she found "support for the contention that planned developments are more homogeneous than other neighborhoods with respect to race. They are more heterogeneous than other neighborhoods due to greater representation of middle- to high-income categories" (456). She found that the planned developments had fewer black and Hispanic residents compared with comparable non-planned development areas. But on the issue of income diversity, she used an entropy measure that was not sensitive to equal representation at the top and bottom of the income distribution. Consequently, the apparent greater income diversity in planned developments was due to the fact that the planned developments included more people in the upper-income categories than the non-planned development suburban block groups.

Gordon concludes that the overall contribution of planned developments to segregation was minor when the many other relevant factors were taken into account. She emphasizes, however, that because she used 1990 data, the overall proportion of planned developments in the housing stock was relatively low. The rapidly rising share of such developments after 1990 means that "the effects of these communities on residential segregation may become more pronounced" (456).

Manzi and Smith-Bowers (2005) challenged what they saw as a standard perception of gated communities as institutions that promote social separation and benefit the wealthy to the detriment of the rest of society. They note that these perceptions have informed public policies: "Central and local governments in the UK have . . . attempted to prevent a replication of the spatial polarisation of North American inner cities, by discouraging gated developments, restricting planning approval and encouraging neighbourhood renewal schemes based on more 'traditional' design layouts" (346).

But their study, using economist James Buchanan's "club goods" theoretical model (Buchanan 1965) and two case studies of housing developments—one in outer London and the other in inner London—supports different conclusions. They dispute the notion that there is necessarily an antipodal relationship between gated communities and social cohesion and demonstrate that gated communities are not just for the wealthy. On the contrary, they argue, "whilst formerly associated with elite groups who could afford the luxury of these kinds of purchases, rising real incomes and the comparative fall in security and monitoring costs are bringing these goods within the budgets of middle-income households" (Manzi and Smith-Bowers 2005, 348). Through interviews with residents, officials, and others, they document that the security features of these communities enable homeowners to live in neighborhoods that would otherwise have been exclusively occupied by lower-income renters. In that sense, an admittedly homogeneous gated community can facilitate the creation of a mixed-income, mixed-tenure neighborhood. "This case study suggests that one way to promote mixed tenure developments in areas of deprivation is to acknowledge community members' concerns for safety and security. The study suggests this can be done by developing gated sub-subsections in the neighbourhood" (354).

Moreover, these authors argue, the use of gates and other security measures is often a rational response to genuine fear of crime rather than an irrational response to a "culture of fear." Security measures are a club good, and the private community structure allows residents to solve this and other problems collectively in ways that are neither fully public nor fully private. Therefore, while such communities admittedly separate people into "beneficiaries" and "non-beneficiaries" of the club goods they provide, they do not necessarily foster income segregation and in fact "help to reduce residential segregation in areas that otherwise would have accommodated either multi-deprived households exclusively or have been used for other purposes" (357).

A comparative study of gated communities in Canada and Israel examined the complexity of the social separations that private communities engender, going beyond the notion of simple segregation of races or social classes (Rosen and Grant 2011). According to the authors of this study,

> Physical mechanisms for managing and reproducing social difference persist both in political contexts that celebrate diversity (such as Canada) and in political circumstances that seek to manage conflict rooted in difference

> (such as Israel). An examination of gated communities in differing cultural and historic contexts demonstrates the ways in which culture and politics mediate how this urban form is implemented and interpreted, and contributes to ongoing efforts to develop theory to explain the phenomenon. (790)

The authors highlight the many different functions that gated communities can perform in different cultural contexts. These functions include keeping "the other" out, or in; keeping factions or social classes apart; empowering or giving advantages to certain social groups over others; and creating community identity and cohesion for some groups. Developers also use gated communities to target particular populations. They note that "in societies where categories of individuals (for example, single women, elderly persons) feel vulnerable in mixed neighbourhoods, security systems may provide a substitute for social networks" (790).

In a study often cited by those who challenge the dominant view of gated communities, Sanchez, Lang, and Dhavale (2005) used U.S. Census data to show that the common perceptions of these locations as enclaves for the exclusionary wealthy are not necessarily supported by the data.

> While much of the attention has focused on the demographic characteristics and geographic distribution of upscale gated communities, little attention has been devoted to other dimensions of enclosed communities represented by low-income, renter households. Recent data released by the U.S. Census Bureau as part of the 2001 American Housing Survey (AHS) shows that low-income renters are actually more likely to live in walled or gated communities compared to affluent homeowners. Because class and race are correlated in the United States, the owner and renter distinction translates into a separation of high-income from low-income and Whites from non-Whites. While affluent White homeowners in gated communities have been extensively profiled, the gated, low-income, non-White renters have not. We suspect these two worlds reflect a divide between gated communities, one the result of status versus one motivated by concern for security. (281)

Sanchez, Lang, and Dhavale found differences between gated and non-gated homeowners, and between both groups of renters. For example, gated owners had a mean income of $87,794, versus $73,172 for non-gated owners—almost 20 percent more. Renters in gated communities earned a mean income of $39,735, versus $35,461 for non-gated renters, or 12 percent more. But the authors also found that "contrary to the notion that primarily affluent homeowners live in gated communities, the results of the AHS survey show that renters are nearly 2.5 times more likely to live in walled or fenced communities and over 3 times as likely to have controlled entries. These renters include households in public housing projects, which often have walled and gated design elements" (285). This

study highlights the importance of understanding social and economic segregation in context and in detail.

Walks (2014) undertook an empirical study of 20 gated communities in Canada and found that contrary to the American experience, the major motivation for living in such a community was not fear of crime but "prestige, privacy, and the provision of leisure amenities and activities" (44). Private communities in Canada are often more about age segregation, as the elderly seek to self-segregate during their "golden years." In addition, "gated communities, in the aggregate, are not concentrating the wealthy" (52). Ultimately, Walks found that Canadian gated communities do not contribute to segregation as the term is usually understood. However, there is the potential that these communities could promote certain types of social segregation.

> Within the Canadian context, these findings primarily support a perspective in which gated communities are developed to provide specialised amenities and features not elsewhere available—which may include the collective "club realm" governance of local services—instead of arising out of a desire for social exclusion. Gated communities in Canada may serve as neighbourhood innovations that facilitate the spatial concentration of those who share similar residential preferences, rather than similar socio-demographic characteristics, perhaps dispelling the hypothesis necessarily linking gating to segregation. This does not preclude gated communities from potentially becoming vehicles for segregation in the future, but for this to happen the factors spurring on the demand and supply of gating would have to change considerably from those uncovered herein. (62)

A study of private communities in China found an amazing diversity that includes not just luxury gated communities but also condominiums for retired teachers and other government workers, in a variety of price ranges. "The contemporary Chinese walled *cities within a city* are all the more interesting in that they are a genre of development adapted to all income levels—from the poor still living in courtyard housing to the rich in Beijing and Shanghai's Californian-style residential theme-parks, and the old-ownership and middle-income condo dwellers in between" (Webster, Wu, and Zhao 2006, 168).

Conclusions

Theory suggests that residential segregation by income is to be expected in the U.S. housing market as the result of processes of sorting that appear inevitable. According to several theories, different preferences and varying ability to pay for desirable features and neighborhood attributes necessarily lead to some degree of income segregation.

Moving from theory to empirical reality, we see an interesting convergence. The rise of private communities temporally coincided with an increase in income inequality and an increase in residential segregation by income. These three

trends occurred from the 1970s to the present. Clearly, the trends are related to one another. The relationship between two of the three variables appears to be directional: empirical evidence supports the conclusion that increasing income inequality contributes to increasing residential segregation.

The role of the third variable—the rise of private communities, many of them gated—is more complex. Gated communities have the potential to create segregated neighborhoods if that is a developer's intent and the demand is there. CID housing facilitates the niche marketing practiced by large developers, who use increasingly sophisticated, data-driven techniques to sell housing to narrow slices of the income distribution and cater to the demands of consumers for neighborhoods that suit their household characteristics and lifestyles. Private amenities appeal to those who can afford to pay for them while also paying a full share of property taxes.

Yet the empirical evidence on private, often gated, communities offers more than one view. The bulk of the studies suggest that private communities promote a multifaceted segregation that divides people by income, class, and other factors. These studies show that CID housing, especially when it includes private security measures, caters to affluent people who wish to be spatially and institutionally separated from their surrounding environments, where the people are less affluent and more dependent on public institutions.

Other empirical studies have found that even internally homogeneous private communities can contribute to overall neighborhood diversity because they bring middle- and upper-middle-income residents into neighborhoods they would otherwise avoid. These studies show that private communities, especially those with security, are not limited to the affluent and that many lower-income people live in such communities. This is true in the United States and in other countries as well.

It appears that CID housing facilitates the process of the rich becoming segregated from everyone else. However, beyond that observation, the specific contribution of private communities to residential income segregation is hard to quantify and may vary depending on the context. Ultimately, CID housing is a real estate development tool, an instrument of public policy makers, and an expression of individual consumer preferences. It can be used for exclusionary and segregative purposes. It can also be a vehicle for promoting inclusionary policies and practices that aim to house the middle and upper-middle classes in redeveloped urban neighborhoods. If we view CID housing as a tool, the responsibility for its impact on our society rests with developers, policy makers, and consumers alike.

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COMMENTARY
Gerald Korngold

In 1994, Evan McKenzie published the urtext on the rights of individual owners in homeowners' associations, *Privatopia: Homeowner Associations and the Rise of Residential Private Governments* (McKenzie 1994). In this chapter, he addresses the question of whether common interest developments (CIDs) have contributed to a general stratification of the housing market. After conducting a comprehensive and thoughtful analysis of the literature on the issue, he concludes:

> Ultimately, CID housing is a real estate development tool, an instrument of public policy makers, and an expression of individual consumer preferences. It can be used for exclusionary and segregative purposes. It can also be a vehicle for promoting inclusionary policies and practices that aim to house the middle and upper-middle classes in redeveloped urban neighborhoods. If we view CID housing as a tool, the responsibility for its impact on our society rests with developers, policy makers, and consumers alike.

Three further directions of inquiry may be helpful in exploring, if not implementing, McKenzie's conclusion. These involve data, normative issues, and legal considerations.

Data

Several of the existing studies do not seem directly related to the question of stratification, especially in the current climate. Investigations of gated communities can be misleading. While at times gates are powerful symbols of exclusion (and not so powerful when they enclose the entrance of a middle-income apartment building), actual exclusion is usually achieved through high homeowners' association fees arising from a high level of community amenities (annual exclusionary costs), as well as minimum lot size and building and architectural standards (acquisition exclusionary costs). It is these costs, not gates, that typically make CID housing unaffordable.

Further, deeper segmentation of the data is necessary to make real judgments about stratification. CIDs run the gamut from eight-figure oceanfront homes to middle-income housing cooperatives with caps on resale prices. Also missing in the studies are good numbers on the percentage of new homes built in CIDs versus those built outside them over the past several decades. These data would indicate whether consumers have meaningful alternatives and at what costs. Finally, demographic slicing based on the ages of CID owners is needed to understand the demand by millennials for such housing.

Normative Issues

Policy makers, courts, and legislatures are faced with competing normative considerations in deciding whether to address stratification and CIDs. Arguing against intervention by these entities are general laissez-faire ideas (CIDs represent free choices by individuals), the beliefs that CIDs are not uniformly "for the rich" and that our society tolerates wealth differences, and perhaps Tiebout theory. Arguments in favor of intervention are the belief that economic segregation in housing leads to poor outcomes in health, educational and employment opportunities, and housing value appreciation, among others.

Legal Considerations

Even assuming that policy makers believe that CIDs cause stratification, they may have only limited legal tools to address the situation. Importantly, while CIDs are created today pursuant to statutory authorization, in the past they were, and still can be, created under common-law principles.

The earliest cooperative apartments in New York City were ventures organized by the wealthy on Park Avenue, Fifth Avenue, and Central Park West, where cooperators pooled their cash and acquired buildings by utilizing standard corporate and landlord-tenant law. Subsequent legislation in New York State, such as the 1971 Banking Law that allows banks to grant mortgages on the security of cooperative shares and leases, have helped make these arrangements available to middle-class owners.

The common law could have been used to create the same legal structure as a condominium by employing air rights, easements, and covenants. Passage of condominium statutes across the country was necessary, however, to assure institutions lending to middle-class (and other) buyers of the legitimacy of such arrangements. The statutory authorization also avoids the need for expensive (and perhaps unaffordable) bespoke documentation that common-law arrangements would require. These statutes have helped democratize CID housing by validating financing and lowering transaction costs.

In other regards, state legislatures could prohibit subdivision covenants that directly exclude rental tenants because of the source of their payments, such as subdivision bans on renters participating in government rent assistance programs like Section 8 (Geggis 2014). These subdivision covenants discriminate between people with equal buying power, creating class discrimination as well as market distortions. While a full ban on renters represents a desire to have only those with long-term investments living in the community, distinguishing between tenants able to pay based on source of income smacks of class discrimination that a legislature may resist.

Moreover, state legislatures could theoretically address the stratification effects of CIDs through inclusionary zoning, assuming that there is the political will to do so. One type of inclusionary zoning requires mandatory set-asides of

affordable housing in new CIDs in exchange for land use regulatory approval. These mandatory provisions have been struck down by some courts, which have found them to be takings of the developer's property or violations of the equal protection or due process clause (Mandelker 2003). Given that only a few states have adopted set-asides that have survived challenges and that CID developers have significant political savvy, it may not be likely that many additional legislatures will impose such requirements on CIDs in the future. An alternative method of providing inclusionary housing is through incentive zoning, in which developers are given zoning benefits for setting aside affordable housing units. CID builders, however, may prefer not to utilize incentive zoning if they believe that the presence of affordable units will impact negatively on their sales and pricing of market-price homes. Moreover, even if a CID agrees to include affordable housing in order to obtain zoning incentives, stratification may not be alleviated, as the story about a New York City condo having a separate entrance for affordable housing tenants starkly illustrates (Briquelet 2013).

The power of local land use bodies to exact affordable housing in CIDs through the approval process is limited as well. Such power must trace to an overall legislative authorization, and as indicated above, such legislation might be subject to a variety of constitutional challenges. Moreover, U.S. Supreme Court decisions, from *Nollan v. California Coastal Commission* to *St. Johns River Water Management District v. Koontz*, have demonstrated sensitivity to the use of the exaction process to "extort" "improper" concessions from landowners.[1]

Judicial intervention may be similarly limited. It would be difficult to challenge minimum lot requirements within a CID on constitutional grounds, since there is no state action in the decisions of private owners to require certain lot sizes (Korngold 2004). As a result of such choices, however, many lower-income people might be unable to acquire property in the CID. Moreover, it is hard to imagine a theory under which judges could strike down high association fees to support CID amenities. Members have the right to contract freely (Korngold 2004); such a decision might force an association to default on its obligations to third parties (e.g., security companies); and even a public entity—a city—is free to offer whatever amenities (parks and the like) its residents want, and to assess corresponding taxes to pay for them. Under this reasoning, ongoing residency in a CID could remain unaffordable for many.

In sum, McKenzie has provided an important challenge to policy makers. This commentary suggests that more data are needed, a serious discussion of norms must take place, and legal solutions will not be easy to find even if there is a will to act.

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1. *Nollan v. California Coastal Commission*, 483 U.S. 825 (1987); *St. Johns River Water Management District v. Koontz*, 133 S. Ct. 2586 (2013).

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12

Socioeconomic Segregation Between Schools in the United States and Latin America, 1970–2012

Anna K. Chmielewski and Corey Savage

Residential segregation by income in the United States has risen dramatically since 1970 (Reardon and Bischoff 2011; Watson 2009). From 1970 to 2010, income segregation between school districts appears to have increased as well (Owens 2014). This raises the concern that the educational and life experiences of children from different economic backgrounds are becoming more divergent, which could erode equal opportunity. However, recently released data from the Programme for International Student Assessment (PISA) reveal that the level of segregation between schools by socioeconomic status (hereafter "school SES segregation") is far worse in Latin America than in the United States. Indeed, Latin American countries have among the highest levels of school SES segregation of all PISA countries, while school SES segregation in the United States is close to the international average.

The study reported in this chapter relied on data from PISA and other international large-scale assessments to compare school SES segregation across the United States and nine Latin American countries. First, it documents recent trends in school SES segregation since 2000 and longer-term trends since 1970. Second, it examines whether segregation is changing mainly at the top or at the bottom of the SES distribution by comparing the segregation of high-SES students and the segregation of low-SES students from their peers. This gives an international context to research in the United States showing that for both neighborhoods and school districts, income segregation is increasing primarily at the top of the income distribution, meaning that the affluent are becoming more isolated (Owens 2014; Reardon and Bischoff 2011). Third, this chapter explores a number of

possible explanations for greater segregation in Latin America, as well as explanations for changes in segregation over time. Previous research in the United States has tied increasing residential and school segregation to increasing income inequality (Owens 2014; Reardon and Bischoff 2011; Watson 2009), and also tied increasing school segregation to the fragmentation of school districts and the availability of private school options (Owens 2014). The chapter examines these phenomena, along with other issues relevant to the Latin American context, including urbanization, increasing access to secondary schools, and publicly funded voucher schools.

Factors Contributing to SES Segregation Between Schools

RESIDENTIAL SEGREGATION

An important contributor to school SES segregation is the SES segregation of neighborhoods. This is true both in systems where children attend schools strictly on the basis of where they live and, to a lesser degree, in systems with school choice, as location can be a factor in families' school attendance decisions (Denton 1995; Flores 2014). Thus, one explanation for higher levels of school SES segregation in Latin America compared with the United States may be higher levels of residential SES segregation in Latin America. Unfortunately, there is little information available comparing levels of neighborhood SES segregation either across Latin America or between Latin America and the United States. The only recent paper on the topic found that the residential segregation of low-income households in U.S. cities is much higher than in Mexican cities (Monkkonen 2010), which implies that the greater observed school SES segregation in Mexico compared with the United States may be the result of educational factors rather than neighborhood SES segregation. In the absence of further direct comparative evidence regarding neighborhood SES segregation, this study examined two conditions that may contribute to neighborhood SES segregation: urbanization and income inequality.

Researchers have found that U.S. cities with larger populations have higher levels of neighborhood income SES segregation and have seen greater increases in income segregation than cities with smaller populations (Reardon and Bischoff 2011; Watson 2009). Similarly, larger cities in both Brazil and Mexico appear to have higher levels of residential SES segregation (Monkkonen 2010; Telles 1995). Latin America is the most urbanized region in the world, with 80 percent of its population living in cities. Most Latin American countries are far more urbanized than the United States and the rest of the developed world (UN-Habitat 2012). Greater urbanization may be one explanation for higher levels of school SES segregation in Latin America compared with the United States. In addition, urban residential patterns differ between the United States and Latin America. Whereas U.S. metropolitan areas over the past 60 years have been characterized by a pattern of affluent suburbs and deteriorating urban centers (Dreier, Mollenkopf,

and Swanstrom 2001; Judd and Swanstrom 2011; Massey and Denton 2003), Latin American cities have been characterized by an elite urban residential sector surrounded by "concentric zones of decreasing residential quality" (Griffin and Ford 1980, 422). Both patterns may be changing, however, as the American professional class has been moving back to the urban core (Dreier, Mollenkopf, and Swanstrom 2001; Judd and Swanstrom 2011; Massey and Denton 2003), while since the 1980s Latin America has seen an influx of gated suburban communities set amid areas of extreme poverty (Coy 2002; Sabatini and Salcedo 2007) and small pockets of high- or low-SES neighborhoods in what seem to be homogeneous areas (Skop and Peters 2007). Even so, the predominant pattern of low-SES residents living on the periphery of cities persists in many Latin American countries, including Mexico (Monkkonen 2010), and some argue that the advent of gated communities has not necessarily increased social and residential segregation given that affluent residents were already highly segregated from the poor and working class (Álvarez-Rivadulla 2007). Despite these differences in urban residential segregation patterns, we nevertheless hypothesize that greater urbanization is associated with greater school SES segregation in both the United States and Latin America.

The second important factor contributing to neighborhood SES segregation is income inequality. In the United States, increasing income segregation is strongly related to increasing income inequality (Reardon and Bischoff 2011; Watson 2009). Although the United States has the highest income inequality in the developed world, inequality is considerably higher in Latin American countries (LIS 2014; World Bank 2014). Indeed, Latin America is the region with the highest levels of income inequality in the world, with the possible exception of Africa (Gasparini, Cruces, and Tornarolli 2011). Throughout the 1990s, income gaps across Latin America increased with the rise in income among the upper classes and the stagnation of income among the working classes (Gasparini 2003; Portes and Hoffman 2003; Portes and Roberts 2005). However, during the 2000s, income inequality has begun to decrease slightly across Latin America, even as it has continued to rise in the United States (Gasparini, Cruces, and Tornarolli 2011). This slight convergence in income inequality between the United States and Latin America could predict a convergence in neighborhood SES segregation as well. Income inequality is also connected to the patterns of urbanization described in the previous paragraph. Larger cities in the United States tend to have higher income inequality than smaller cities (Berube 2014). Similarly, in some Latin American countries, including Brazil, Chile, Colombia, and Peru, income inequality is higher in cities than in rural areas. In others, however, the reverse is true: rural areas have higher income inequality than cities in Bolivia, Guatemala, Honduras, and Nicaragua (UN-Habitat 2008). Greater income inequality in cities may be one mechanism through which urbanization affects neighborhood SES segregation.

An important contributor to neighborhood SES segregation in both the United States and Latin America is race (de Lima Amaral 2013; McEwan 2004).

The study described in this chapter focused exclusively on SES segregation rather than racial segregation because information on race was not available in the international assessment data used.

NONRESIDENTIAL FACTORS

Beyond cross-national differences in residential SES segregation, there are some key differences in the structure of educational systems between Latin America and the United States that might also explain higher levels of school SES segregation in Latin America. Specifically, very high and increasing rates of school choice and private schooling in most Latin American countries could elevate school SES segregation to levels beyond those directly caused by residential SES segregation. Whereas approximately 26 percent of secondary schools in the United States are schools of choice, in the sense that they do not take residence into consideration for admission, the share of schools of choice in Latin America ranges from 34 percent in Mexico to 93 percent in Peru (authors' calculations using PISA 2012 data). Many of these Latin American schools of choice are private schools. While the share of students attending private schools in the United States has generally remained below 10 percent, the share in many Latin American countries is closer to 15 percent, and as high as 32 percent in Argentina and 63 percent in Chile (authors' calculations using PISA 2012 data). The vast majority of the private schools in those two countries are publicly funded through voucher programs. Although voucher schools were originally intended to combat school SES segregation by breaking the link between segregated neighborhoods and school attendance, evidence from Chile shows that school SES segregation has increased since the implementation of the voucher program (Elacqua 2012; Hsieh and Urquiola 2006; Torche 2005) and that ultimately schools have become more socioeconomically segregated than neighborhoods (Valenzuela, Bellei, and de los Ríos 2014). This is largely because low-income families in Chile are less likely than higher-income families to take advantage of school vouchers, for several reasons: many voucher schools continue to charge additional fees; many voucher schools are academically selective, which disproportionately favors middle- and high-income students; and travel to distant schools is burdensome for low-income families in terms of cost and safety concerns, particularly for younger children (Flores 2014).

Aside from school choice, three additional educational factors could contribute to higher levels of school SES segregation in Latin America than in the United States. First, in Latin America access to secondary education has expanded dramatically over recent decades. While as recently as 2000, secondary school enrollment rates for the eligible age cohort were under 50 percent in many Latin American countries, rates are now closer to 70 percent in most countries, and in Argentina and Chile they are approaching the U.S. rate of 89 percent (World Bank 2014). These newly enrolled students are likely to be low-SES and low-achieving, meaning the educational system must deal with increasingly diverse student populations. If these students tend to enter schools that are isolated from

their high-SES peers—perhaps because they are located in remote rural areas or because high-SES families are exiting the public educational system for private or selective schools—this could result in increasing segregation between schools. Depending on the mechanism, expansion of secondary schooling could result in levels of school SES segregation that more closely approximate those of neighborhood SES segregation, because a greater proportion of the population is included in schools, or it could cause school segregation to be higher than neighborhood segregation if it prompts high-income families to self-segregate.

A second factor that could contribute to school SES segregation is school size. Researchers have found that in the United States, fragmentation into smaller educational units (in this case, school districts) tends to correspond to higher levels of both SES and racial segregation (Bischoff 2008; Owens 2014). If this pattern holds with schools as the educational unit, we might expect smaller schools to predict higher levels of segregation. According to PISA 2012 principal questionnaires, secondary schools in Latin America tend to be smaller than U.S. high schools. While U.S. high schools average around 1,400 students, Latin American secondary schools tend to be under 1,000 students (and as small as 500 students in Argentina); the only exception is Colombian secondary schools, which are similar in size to U.S. high schools (authors' calculations using PISA 2012 data). Not only are Latin American secondary schools smaller than U.S. high schools on average, but they also seem to be getting smaller over time. Between 2000 and 2012, school size appears to have decreased in nearly all Latin American countries, including dramatic declines of about 40 percent in Peru and Brazil. The one exception is Uruguay, which has nearly doubled its average school size (authors' calculations using PISA 2000–2012 data). Although we generally expect decreasing school size to be associated with rising school SES segregation, the underlying reasons could depend on the level of school choice in the system. In the absence of school choice, smaller schools correspond to smaller residential catchment areas, meaning school SES segregation would increase as it came to resemble more closely neighborhood SES segregation. In a system with school choice, declining school size may reflect a growing private school sector, as private schools tend to be smaller than public schools. A growing private school sector could in turn increase school SES segregation for reasons discussed previously.

The third factor that could contribute to school SES segregation is academic versus vocational tracking. It is a well-known finding from PISA that the countries that track students early into separate academic and vocational schools tend to have some of the highest levels of school SES segregation (Willms 2006). However, this type of tracking is practiced mainly in Western Europe, while tracking appears different in the United States and Latin America. The United States and Latin America both have relatively low rates of vocational tracking, ranging from 0 percent in the United States and Peru to 23 percent in Chile (World Bank 2014). Additionally, much of this tracking occurs only among older students at the upper secondary level (Castro, Carnoy, and Wolff 2000) and thus would not be captured in the data used in the current study. The slightly higher rates of voca-

tional tracking in Latin America could be another small contributor to higher levels of school SES segregation; however, based on the low rates overall, tracking was not expected to be a major factor predicting school SES segregation in the United States or Latin America.

In sum, the higher levels of school SES segregation in Latin America compared with the United States may not be attributable to residential SES segregation at all, but instead to the nonresidential, educational factors reviewed above. Latin America has dramatically higher levels of school choice and privatization, increasing access to secondary schooling, smaller school size, and slightly higher levels of vocational tracking, all of which are expected to be associated with higher school SES segregation. In order to evaluate the extent to which school SES segregation is a function of residential SES segregation, in the absence of neighborhood data, we examined elementary schools. We hypothesized that Latin American elementary schools are less affected by school choice than secondary schools, as parents of young children might be less likely to exercise school choice, or if they do, they might choose schools closer to home (Flores 2014). Still, it should be noted that elementary school segregation is far from an ideal measure of neighborhood segregation in Latin America, as the rate of private schooling is only slightly lower in elementary than in secondary schools (around 23 percent for elementary versus 26 percent for secondary) (World Bank 2014). Furthermore, in many Latin American countries, large numbers of students attend schools serving the first through twelfth grades. Whereas only around 6 percent of high school students in the United States attend schools containing elementary school grades, on average around 40 percent of Latin American students, and up to 87 percent of students in Colombia, attend such schools (authors' calculations using PISA 2009 data). Thus, elementary schools and secondary schools are often not separate systems in Latin America. Nevertheless, we examined elementary school data as the best available evidence on the relationship between school segregation and residential segregation.

Research Questions

- Which countries in Latin America and the United States have the highest and lowest levels of SES segregation between schools?
- In which countries is school SES segregation primarily concentrated at the top or the bottom of the SES distribution? In other words, which countries have the highest levels of segregation of wealthy or poor students?
- How do secondary school segregation levels compare with elementary school segregation levels?
- Has SES segregation between schools increased or decreased in recent years (2000–2012) and over the long term (since 1970)?
- Are differences in SES segregation across countries and changes in SES segregation within countries associated with social conditions (income inequality, urbanization) and/or with educational conditions and policies

(secondary school access, school size, vocational tracking, school choice, private schooling)?

Data

The data for the main analyses of this study came from PISA 2000, 2003, 2006, 2009, and 2012. PISA is a repeated cross-sectional study conducted by the Organisation for Economic Co-operation and Development (OECD) to test nationally representative samples of 15-year-old students, regardless of grade, in reading, math, and science. PISA uses a two-stage sampling design in which (1) schools are sampled with probabilities proportional to their enrollment of 15-year-olds; and (2) about 35 students are sampled within each school. The number of countries participating in PISA ranged from 45 in 2000 to 66 in 2012. The United States and two Latin American countries (Brazil and Mexico) participated in all five years of the study. Seven more Latin American countries (Argentina, Chile, Colombia, Costa Rica, Panama, Peru, and Uruguay) participated in at least one year of the study, for a total sample of 10 countries and 36 country-years.

For comparisons between secondary school and elementary school SES segregation, we use data from two years of the Progress in International Reading Literacy Study (PIRLS), 2001 and 2011. PIRLS is also a repeated cross-sectional study, but unlike PISA, it is conducted by the International Association for the Evaluation of Educational Achievement (IEA), and it tests nationally representative samples of fourth-grade students in reading. PIRLS uses two-stage sampling. The study samples schools with probabilities proportional to size, and then samples intact classrooms rather than students from across the entire school. The number of classrooms sampled was either one or two, depending on the country, but in all of the Latin American countries participating in PIRLS, only one classroom was sampled in all or almost all schools. Therefore, we interpreted SES segregation estimates between elementary schools with caution, as they may partially reflect SES segregation between classrooms and may therefore overestimate SES segregation between schools. Four Latin American countries participated in at least one year of PIRLS; we used PIRLS 2001 data for Argentina and Belize, and PIRLS 2011 data for Colombia and Honduras.

To examine long-term trends in school SES segregation, we used data from the First International Science Study (FISS), which was conducted in 1970. FISS tested nationally representative samples of 14-year-old students, regardless of grade, in science and sampled students from across the school rather than as intact classrooms, similar to PISA. Only two of the countries in the current study participated in FISS: Chile and the United States.

VARIABLES

Socioeconomic Status For the main analyses of this study, we calculated segregation based on the PISA "index of economic, social, and cultural status"

(ESCS), an OECD-developed index that combines the higher of student-reported mother's and father's educational attainment, the higher of the mother's and father's occupational status, as well as a list of household possessions, such as books, computers, and the student's own bedroom. For PISA 2000, 2003, 2006, and 2009, we used the ESCS index rescaled by the OECD for trend analyses with PISA 2012 data. The continuous index has a mean of 0 and a standard deviation of 1 across all OECD countries (32 relatively high income countries); the mean was below 0 in the Latin American countries in our sample. When calculating segregation, we converted the index into country-year–specific percentiles, which are described further in the methods section. For clarity and consistency of terminology, the ESCS index is hereafter referred to as the "SES index."

Parental Occupation Since the SES index is available only in the PISA data, for analyses using data from the other studies (PIRLS and FISS), we calculated segregation based on parental occupation. In PISA, parental occupation (which is also a component of the SES index) is reported by students and is classified by the OECD into four-digit International Standard Classification of Occupations (ISCO) codes. For comparability with the PIRLS and FISS occupational data, we took the first digit of each ISCO code, resulting in nine categories, and ordered the categories from lowest to highest average occupational status based on the International Socio-Economic Index of Occupational Status (ISEI). We then took the higher of the mother's and father's occupational categories. In PIRLS, parental occupation is reported by parents in ten categories, which we also reordered according to average occupational status and then took the higher of the mother's and father's occupational categories. In FISS, parental occupation was reported by students only for the father, and the categories varied slightly across countries; there were nine categories in Chile and ten in the United States. The categories of parental occupation for each study are listed in table A12.1. When calculating segregation, we converted parental occupation to country-year–specific percentiles.

Income Inequality We measured income inequality using the Gini index, which we obtained from the World Bank (2014) for Latin American countries and from the Luxembourg Income Study (LIS 2014) for the United States. The Gini index ranges from 0 (perfect equality) to 1 (perfect inequality). In 2010, the Gini index for the countries in the current study ranged from 0.37 for the United States to 0.56 for Colombia. We interpolated the Gini index within countries for missing years. Descriptive statistics for this and all other country covariates are displayed in table A12.2.

Urbanization We measured urbanization using school location from PISA principal questionnaires. We classified as urban any school located in a city (population 100,000 to 1 million) or large city (population greater than 1 million).

In 2012, the sample-weighted proportion of students attending urban schools ranged from 0.15 in Costa Rica to 0.58 in Chile.

Proportion of Cohort Enrolled in School We measured the proportion of the cohort enrolled in school using each country's net enrollment rate of children of the official secondary school age in secondary schools, obtained from the World Bank (2014). In 2011, the proportion of the secondary school–aged cohort enrolled in school ranged from 0.68 in Panama to 0.85 in Chile. We interpolated the enrollment rate within countries for missing years.

School Size We measured school size using school enrollments from PISA principal questionnaires. We took the sample-weighted mean across all schools in each country-year. In 2012, mean school size ranged from 519 in Argentina to 1,455 in Colombia. We divided mean school size by 1,000.

Vocational Tracking We measured vocational tracking using the total enrollment in public and private secondary school technical/vocational programs as a proportion of the total secondary school enrollment, obtained from the World Bank (2014). In 2010, the proportion of secondary school students in vocational programs ranged from 0 in the United States to 0.31 in Chile. We interpolated vocational enrollment within countries for missing years.

School Choice We used PISA principal questionnaires to determine which schools did not consider residence as a factor in school admissions. In 2000, 2009, and 2012, principals reported how often residence in a particular area was considered when students were admitted to their schools. We classified schools whose principals responded "never" or "sometimes" as schools of choice. In 2003 and 2006, principals reported how much consideration was given to residence in a particular area when students were admitted to their schools. We classified schools whose principals responded "not considered" or "considered" (as opposed to "high priority" or "prerequisite") as schools of choice. In 2012, the sample-weighted proportion of students attending schools of choice ranged from 0.26 in the United States to 0.93 in Peru.

Private Schooling We used principal-reported school management from PISA principal questionnaires to classify schools controlled by nongovernment organizations as private schools. In 2012, the sample-weighted proportion of students attending private schools ranged from 0.05 in the United States to 0.63 in Chile. The OECD further classifies private schools into independent schools receiving less than 50 percent of their core funding from government sources and government-supported private schools receiving 50 percent or more of their core funding from government sources (such as voucher schools). In 2012, the proportion of students attending independent private schools ranged from 0.05

in the United States to 0.17 in Uruguay. The proportion of students attending government-supported private schools ranged from 0 in the United States, Mexico, Peru, and Uruguay to 0.48 in Chile.

Methods

MEASURING SCHOOL SES SEGREGATION

We measured school SES segregation using the rank-order information theory index (H^R). This segregation index ranges from 0 (complete integration) to 1 (complete segregation). It was developed by Reardon et al. (2006) for use with variables measured in ordered categories, and it can be interpreted as how much less variation in SES there is within schools compared with the variation in SES in the overall student population. H^R was used in Reardon and Bischoff (2011), a study that examined neighborhood income segregation in the 100 largest metropolitan areas in the United States using family income data from the U.S. census, which is measured in 15 categories. For comparability with Reardon and Bischoff's study, we divided the SES index (converted to percentiles) described in the variables section into 15 evenly spaced categories in each PISA country-year, bounded by 14 percentile thresholds: the 6.6th percentile, 13.3th percentile, etc. We estimated the information theory segregation index of students at each SES percentile threshold *H(p)* as the segregation of students above that threshold from students below that threshold. We estimated the overall SES segregation in a country-year via the rank order information theory index (H^R) by fitting a fourth-order polynomial function through the 14 thresholds via weighted least squares and calculating the weighted average of the values of the fitted line over all SES percentiles from 0 to 1 (weighted by entropy at each SES percentile, which is maximized at the 50th percentile, meaning the middle of the SES distribution is given more weight). Although segregation between units based on a continuous variable such as this SES index could be computed using a simpler measure, such as intraclass correlation, the advantage of H^R is not only that the results are in a comparable metric to those of Reardon and Bischoff but also that this measure allows one to examine the level of segregation (*H(p)*) at any point across the SES percentile distribution. Thus, we also estimated the segregation of low-SES students as *H(10)*, the value of the fitted line at the 10th percentile, and the segregation of high-SES students as *H(90)*, the value at the 90th percentile.

For school segregation based on parental occupation, H^R cannot be estimated as precisely because there are fewer categories and they are not evenly spaced. Thus, after converting these categories into percentiles, we fitted a lower-order polynomial function (quadratic rather than fourth-order) and estimated segregation simply as the value of the fitted line at the 50th percentile—that is, the segregation of students above and below the median parental occupation.

With H^R (and many other similar measures), segregation will be biased upward when samples within units (e.g., schools) are small, which could confound

comparisons if school sample sizes differ across years or countries. Following Reardon and Bischoff (2011), we checked the robustness of our results by randomly sampling 10 students per school before calculating H^R. This robustness check did not affect the PISA results appreciably because PISA sample sizes are relatively consistent across years and countries. Therefore, we used full PISA samples for our PISA results. Sample sizes do vary across the different studies (PISA, PIRLS, and FISS), however, so we used the sampled data for the elementary school and long-term trend analyses, which drew data from multiple studies. This procedure resulted in final segregation estimates that are likely elevated for these analyses, but comparisons across countries, years, and studies should be more accurate.

MISSING DATA

Missing SES data were imputed using multiple imputation by iterative chained equations and creating five imputed data sets for each country-year. Each year of segregation was estimated five times and averaged, and standard errors were calculated to reflect uncertainty due to imputation.

MODELS

To examine relationships between SES segregation and country covariates, we estimated hierarchical growth models as follows:

$$(1) \qquad \hat{S}_{ij} = \gamma_{00} + (X_{ij} - \bar{X}_j)\mathrm{B} + \bar{X}_j\Gamma + \upsilon_j + u_{ij} + \in_{ij},$$

$$\upsilon_j \sim N(0, \tau_{00});\ u_{ij} \sim N(0, \sigma^2);\ \in_{ij} \sim N(0, \omega_{ij}),$$

where $\hat{S}_{ij}$ is the estimated segregation in country j in year i;

X_{ij} is a country-level covariate in year i;

$\bar{X}_j$ is the average of X_{ij} within country j;

B is the coefficient for the within-country covariate;

Γ is the coefficient for the country-average covariate;

τ_{00} is the between-country variance of the true segregation;

σ^2 is the true within-country variance of segregation; and

$\omega_{ij} = [s.e.\ (\hat{S}_{ij})]^2$ is the sampling variance of $\hat{S}_{ij}$.

We estimated equation 1 using a variance-known model in HLM 7.0, which gave greater weight to years in which segregation was more precisely estimated (i.e., where ω_{ij} was smaller).[1] We estimated models predicting overall SES segrega-

1. Models also were run without precision weighting; the results were similar.

tion, segregation of low-SES students (below the 10th percentile), and segregation of high-SES students (above the 90th percentile). Since we had a very small sample size of 10 countries and 36 country-years, we estimated nine separate models, one for each pair of between-country/within-country covariates.

Results

OVERALL SCHOOL SES SEGREGATION

In terms of overall levels of SES segregation between schools, the Latin American countries were substantially more segregated than the United States. Table 12.1 presents all the countries in PISA 2012, sorted from most to least segregated. SES segregation in the United States was estimated at $H^R = 0.17$. This is slightly higher than the estimated residential income segregation (0.157) in the 100 largest U.S. metropolitan areas in 2000 (Reardon and Bischoff 2011) and nearly twice as high as the estimated between-school district income segregation of public school families (0.09) (Owens 2014). (Keep in mind that not only do these estimates based on PISA refer to between-school segregation, but also the SES index used here includes parental education, occupation, and household possessions, but not income.) While SES segregation in the United States was very close to the international average of 0.19, the Latin American countries were dramatically more

Table 12.1
Estimated Socioeconomic Status (SES) Segregation Between Schools, 2012

Country	School SES Segregation	Country	School SES Segregation
Chile	**0.34**	Romania	0.22
Peru	**0.32**	**Argentina**	**0.22**
Mexico	**0.30**	Tunisia	0.21
Panama[a]	**0.30**	Latvia	0.21
Vietnam	0.28	Shanghai-China	0.21
Costa Rica	**0.26**	Slovenia	0.21
Hungary	0.26	Hong Kong	0.21
Brazil	**0.26**	Austria	0.21
Bulgaria	0.26	France	0.21
Thailand	0.25	Belgium-French	0.20
Colombia	**0.25**	Czech Republic	0.20
Uruguay	**0.25**	Portugal	0.20
Slovak Republic	0.24	United Arab Emirates	0.19
Indonesia	0.23	Malaysia	0.19

(continued)

Table 12.1 *(continued)*

Country	School SES Segregation	Country	School SES Segregation
Greece	0.19	England	0.15
Russia	0.19	Qatar	0.15
PISA 2012 Average	*0.19*	Japan	0.15
Turkey	0.18	Denmark	0.15
Australia	0.18	Serbia	0.15
Germany	0.18	Korea	0.15
Italy	0.18	Ireland	0.15
Israel	0.18	Jordan	0.14
United States	**0.17**	Switzerland	0.14
Belgium-Flanders	0.17	Netherlands	0.14
Spain	0.17	Macao-China	0.14
Lithuania	0.17	Canada	0.14
Luxembourg	0.17	Sweden	0.12
Poland	0.17	Montenegro	0.12
New Zealand	0.17	Liechtenstein	0.12
Kazakhstan	0.16	Scotland	0.11
Singapore	0.16	Iceland	0.11
Estonia	0.16	Norway	0.10
Croatia	0.16	Finland	0.09
Chinese Taipei	0.16	Albania	0.08

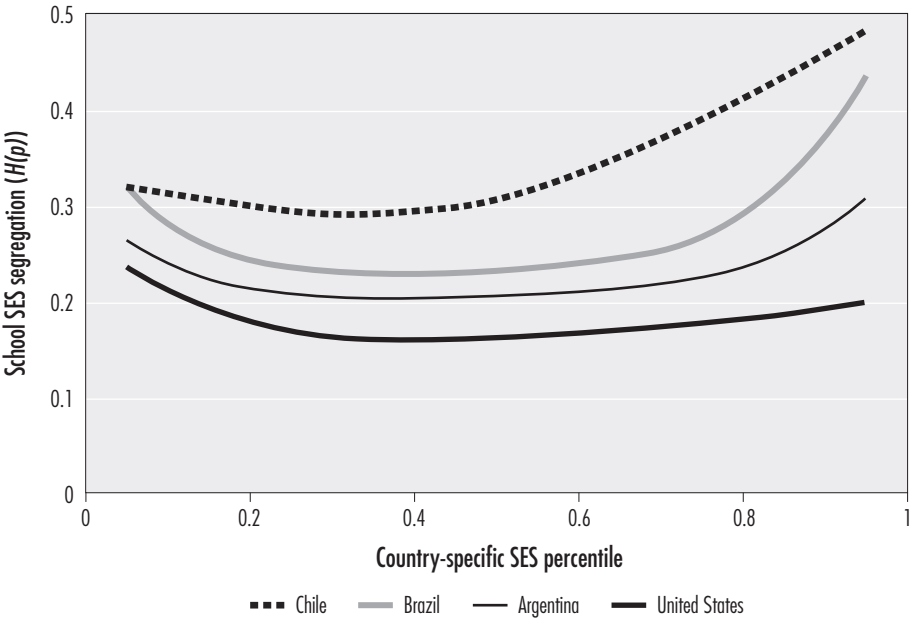
[a]Panama data from PISA 2009.
Notes: Segregation calculated using rank-order information theory index (H^R); see methods section in text for details. Countries sorted from highest to lowest level of between-school segregation. Boldface indicates countries in the current study.
Source: Authors' calculations using PISA 2012 data.

segregated than the average, with H^R ranging from 0.34 in Chile to 0.22 in Argentina. Nine of the sixteen most segregated participating countries are located in Latin America. Among the Latin American countries, Chile, Peru, Mexico, and Panama had the highest levels of between-school SES segregation, with H^R greater than or equal to 0.30. Costa Rica, Brazil, Colombia, Uruguay, and Argentina had somewhat lower but still quite high levels of segregation, with H^R greater than 0.20 but less than 0.30.

SEGREGATION OF WEALTHY AND POOR STUDENTS

Figures 12.1–12.3 show estimated segregation *H(p)* by country-specific SES percentiles for the Latin American countries and the United States, allowing us to

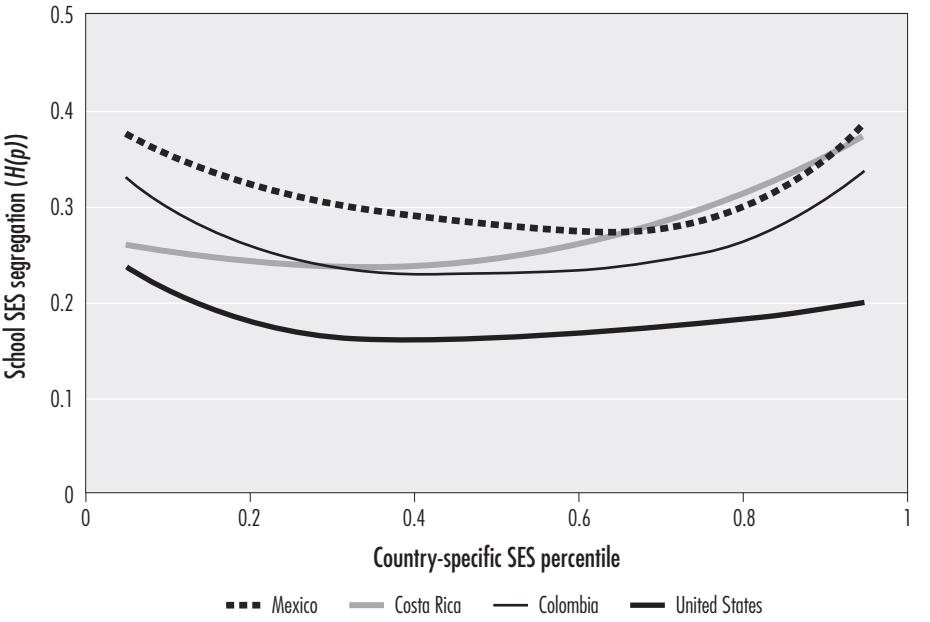
Figure 12.1
Estimated Socioeconomic Segregation Between Schools by SES Percentile: Argentina, Brazil, Chile, and United States, 2012



Note: Segregation calculated using information theory index for each percentile threshold ($H(p)$).
Source: Authors' calculations using PISA 2012 data.

observe the level of segregation at points all along the SES distribution. In comparing the segregation of low-SES and high-SES students from their peers, an interesting pattern emerged in Latin America. Whereas in the United States, high- and low-SES students tended to be about equally segregated from the rest of the distribution—or low-SES students might be slightly more segregated—in many Latin American countries, it was *high*-SES students who were especially segregated from their middle- and low-SES peers. This pattern was particularly evident in two of the most segregated countries overall, Chile and Panama. Their segregation profiles, in figures 12.1 and 12.3, respectively, slope steeply upward from low- to high-SES percentiles. Among the participating Latin American countries, high-SES students were more segregated than low-SES students in Panama, Chile, Uruguay, Brazil, and Costa Rica, while high- and low-SES students were approximately equally segregated in Mexico, Peru, Colombia, and Argentina.

Figure 12.2
Estimated Socioeconomic Segregation Between Schools by SES Percentile: Colombia, Costa Rica, Mexico, and the United States, 2012



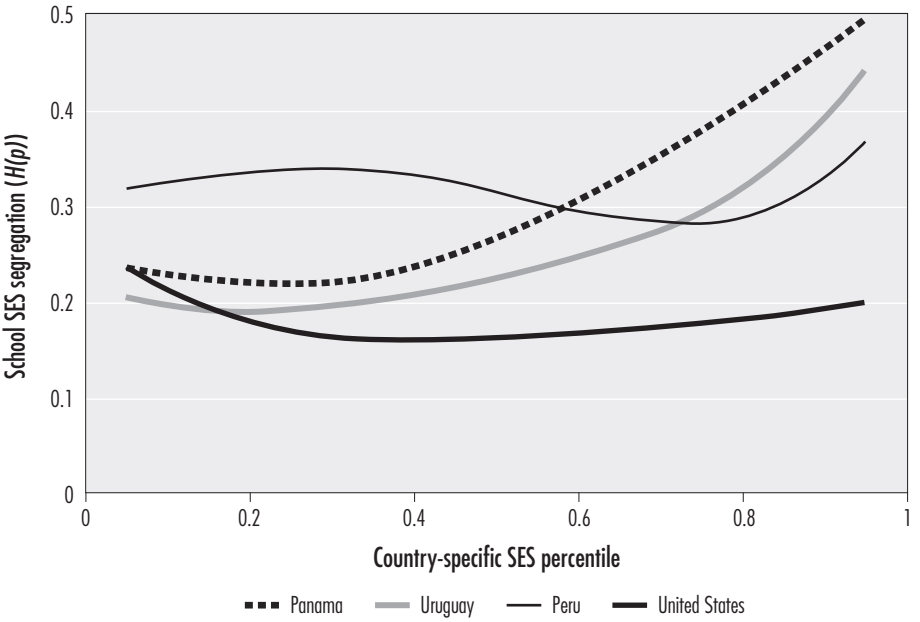
Note: Segregation calculated using information theory index for each percentile threshold (*H(p)*).
Source: Authors' calculations using PISA 2012 data.

ELEMENTARY SCHOOL SES SEGREGATION

The PISA data reflect the educational experiences of 15-year-old students, who are typically in secondary school. In the United States, elementary schools are generally more segregated than high schools because elementary schools have smaller enrollments and therefore draw from smaller catchment areas (meaning elementary schools more closely reflect residential patterns). In Latin America, in contrast, if elementary schools reflect residential patterns more closely than do secondary schools, this could make them *less* segregated than secondary schools, since high levels of school choice may make secondary schools more segregated than neighborhoods (Flores 2014; Valenzuela, Bellei, and de los Ríos 2014). Table 12.2 displays the results for elementary school segregation using data from PIRLS 2001 and 2011 for fourth-grade students and from PISA 2012 for secondary school students.

For both data sets, we calculated segregation based on parental occupation, which generally resulted in slightly lower segregation levels than when using the

Figure 12.3
Estimated Socioeconomic Segregation Between Schools by SES Percentile: Panama, Peru, Uruguay, and the United States, 2012



Note: Segregation calculated using information theory index for each percentile threshold ($H(p)$).
Source: Authors' calculations using PISA 2012 data.

PISA SES index. This analysis showed that, as expected, the typical U.S. pattern of elementary schools being more segregated than secondary schools did not appear to hold in Latin America. Whereas the average level of segregation by parental occupation was 0.23 across the Latin American countries for secondary school (PISA), the average level was only 0.17 across the Latin American countries for elementary school (PIRLS). However, different sets of countries participated in the two studies. When we compared Argentina and Colombia, the only two countries that participated in both studies, we found that SES segregation was very similar across elementary and secondary schools in both countries. Argentina had slightly lower segregation between elementary schools (0.16) than between secondary schools (0.18), while Colombia had slightly higher segregation between elementary schools (0.21) than between secondary schools (0.19). The similar levels of segregation for elementary and secondary schools in these two countries could be due to similar amounts of school choice in elementary

Table 12.2
Estimated Segregation Between Schools by Parental Occupation, Elementary and Secondary Schools

Country	Elementary School (PIRLS)	Secondary School (PISA)
Peru		0.31
Chile		0.30
Mexico		0.24
Panama		0.23
Costa Rica		0.22
Uruguay		0.22
Brazil		0.20
Colombia	0.21	0.19
Argentina	0.16	0.18
Belize	0.17	
Honduras	0.14	
United States		0.15

Notes: Segregation calculated using the rank-order information theory index (H^R) by parental occupation after sampling 10 students within each school; see methods section in text for details. See table A12.1 for categories of parental occupation by study. Countries sorted from highest to lowest level of between-school segregation in secondary schools.
Sources: Elementary school data from PIRLS 2001 for Argentina and Belize; PIRLS 2011 for Colombia and Honduras. Secondary school data from PISA 2012 for all countries except Panama; PISA 2009 for Panama.

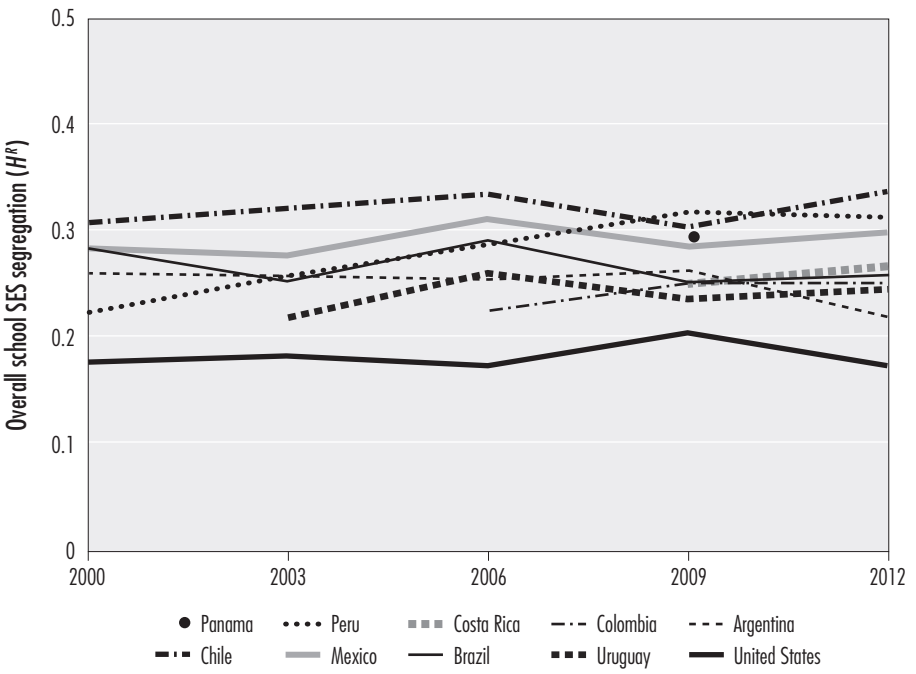
and secondary schools. The rates for private schooling are only slightly higher in secondary schools in both countries—25 percent in elementary and 28 percent in secondary schools in Argentina; 19 percent in elementary and 20 percent in secondary schools in Colombia (World Bank 2014). Additionally, as mentioned previously, relatively large numbers of secondary school students attend schools containing elementary school grades in Argentina (19 percent) and particularly in Colombia (87 percent). Thus, we would not expect very discrepant levels of elementary and secondary school segregation, as these are often not separate schools. The best explanation for slightly higher secondary school segregation in Argentina and slightly higher elementary school segregation in Colombia may be the countries' differences in school size. Based on principal questionnaires from PISA and PIRLS, Argentina's elementary schools are slightly larger than its secondary schools (around 640 students per elementary school versus 520 students per secondary school), while Colombia's elementary schools are considerably smaller than its secondary schools (around 950 students per elementary school versus 1,460 students per secondary school). Note also that since PIRLS sampled a single

intact classroom per school in all participating Latin American countries, while PISA sampled students from across the school, our elementary school estimates may conflate segregation between schools and segregation between classrooms, thus overestimating elementary school SES segregation.

CHANGES IN SCHOOL SES SEGREGATION OVER TIME

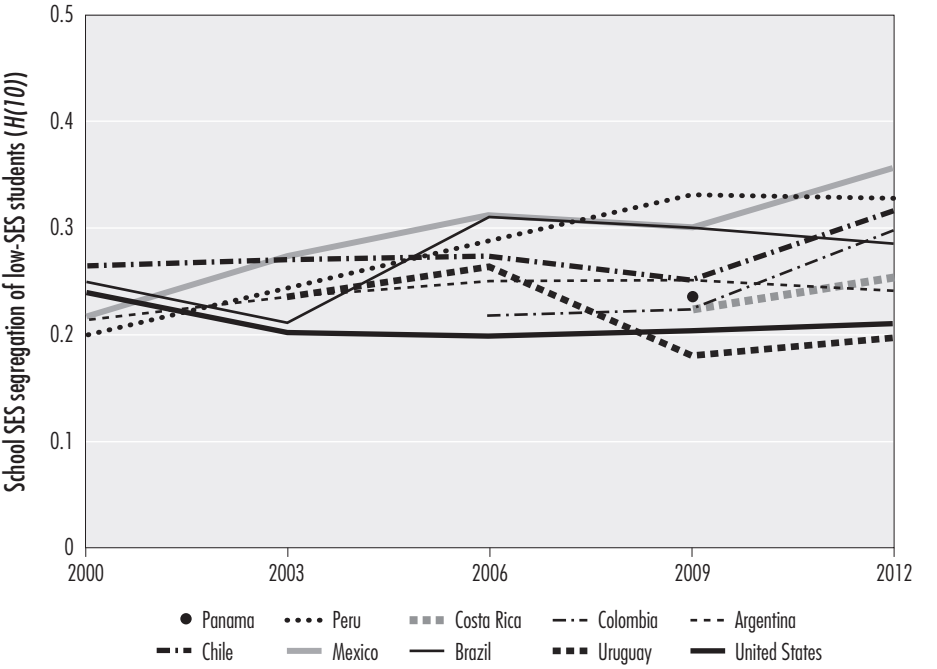
Next, we used the five repeated cross-sectional waves of PISA from 2000, 2003, 2006, 2009, and 2012 to examine national trends in SES segregation. Figure 12.4 shows estimated between-school SES segregation for each year across all the countries in our sample. Overall, segregation appears to have remained stable or increased slightly in most of the countries. In the United States, SES segregation remained around 0.17 throughout the period, except for a slight increase to 0.20 in 2009. Among the Latin American countries, segregation appears to have increased dramatically in Peru; to have increased somewhat in Costa Rica,

Figure 12.4
Trends in Overall Socioeconomic Segregation Between Schools, 2000–2012



Note: Segregation calculated using rank-order information theory index (H^R).
Source: Authors' calculations using data from PISA 2000, 2003, 2006, 2009, and 2012.

Figure 12.5
Trends in Socioeconomic Segregation Between Schools for Low-SES Students, 2000–2012



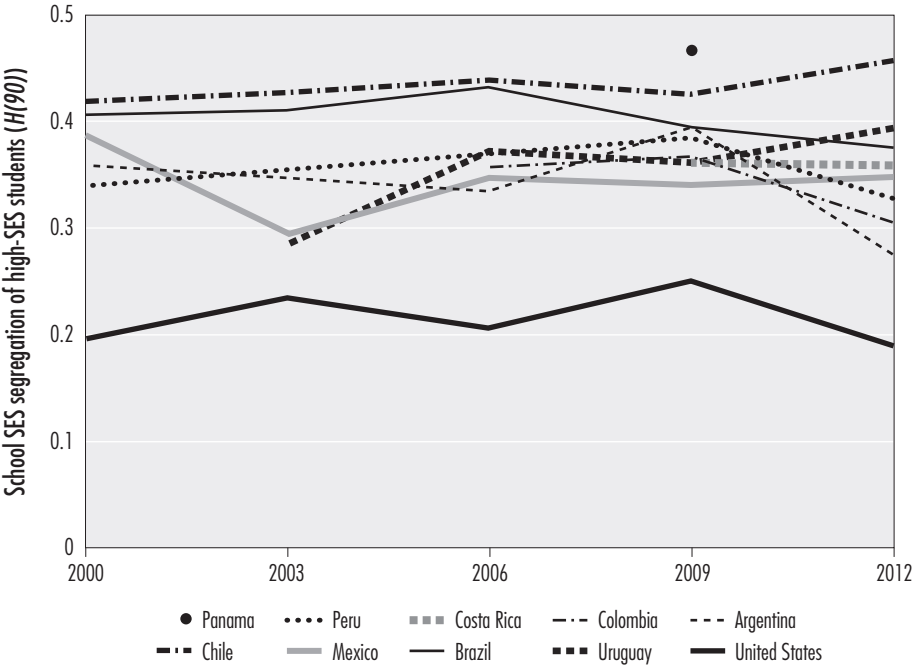
Notes: Low-SES students were defined as those below the 10th percentile. Segregation calculated using information theory index for students above and below the 10th percentile (*H(10)*).
Source: Authors' calculations using data from PISA 2000, 2003, 2006, 2009, and 2012.

Colombia, Uruguay, Chile, and Mexico; and to have decreased in Brazil and Argentina.

Figures 12.5 and 12.6 show trends in segregation from 2000 to 2012 for low-SES and high-SES students, respectively. The segregation of low-SES students increased more than the segregation of high-SES students in most of the countries. Although we observed above that in 2012, high-SES students were more segregated than low-SES students in many Latin American countries, this pattern was even more pronounced 12 years earlier in 2000, when low-SES students were less segregated than in 2012. The segregation of low-SES students increased in Colombia, Peru, Costa Rica, Mexico, Brazil, Chile, and Argentina, while the segregation of high-SES students increased substantially only in Uruguay and Chile.

Table 12.3 displays long-term trends in school SES segregation since 1970 for the two countries in our sample that participated in FISS, the United States

Figure 12.6
Trends in Socioeconomic Segregation Between Schools for High-SES Students, 2000–2012



Notes: High-SES students were defined as those above the 90th percentile. Segregation calculated using information theory index for students above and below the 90th percentile (*H(90)*).
Source: Authors' calculations using data from PISA 2000, 2003, 2006, 2009, and 2012.

Table 12.3
Long-Term Trends in Estimated Segregation Between Schools by Parent Occupation: Chile and the United States, 1970–2012

	1970	…	2000	2003	2006	2009	2012
Chile	0.29	…	0.26		0.29	0.23	0.30
United States	0.21	…	0.11	0.11	0.14	0.19	0.15

Notes: Data for 1970 are for segregation based on father's occupation. Data for 2000–2012 are for SES segregation based on the higher of the mother and father's occupational categories. Segregation calculated using rank-order information theory index (H^R) by parental education after sampling 10 students within each school; see methods section in text for details. See table A12.1 for categories of parental occupation by study.
Source: Data for 1970 from FISS; data for 2000–2012 from PISA 2000, 2003, 2006, 2009, and 2012.

and Chile. For these comparisons, we used segregation based on parental occupation, which is available in both FISS and PISA. We found that segregation based on parental occupation was very high in the United States in 1970 (H^R = 0.21), decreased to 0.11 by 2000, and then increased somewhat after that. In Chile, segregation based on parental occupation was extremely high in 1970 (0.29), decreased somewhat by 2000 to 0.26, but then increased to 0.30 by 2012.

ASSOCIATIONS BETWEEN SCHOOL SES SEGREGATION AND SOCIAL AND EDUCATIONAL POLICIES

Finally, we examined possible explanations for differences in school SES segregation across countries and across years within countries. The results of this analysis are shown in table 12.4. For each country covariate, we first discuss its association with differences across countries in average SES segregation (the "Between Countries" portion of the table) and then its association with changes in segregation over time (the "Within Countries" portion of the table). We also note differences in results for overall SES segregation versus the segregation of

Table 12.4
Coefficients from Hierarchical Growth Models Predicting Socioeconomic Segregation Between Schools from Country Covariates: United States and Latin America, 2000–2012

	School SES Segregation		
	Overall	Low-SES Students	High-SES Students
Within Countries			
Income inequality	–0.06	–1.27**	0.54
	(0.26)	(0.41)	(0.39)
Proportion urban	0.06	0.003	–0.12
	(0.08)	(0.18)	(0.17)
Proportion of cohort enrolled	0.28**	0.62***	0.002
	(0.10)	(0.16)	(0.18)
School size/1,000	–0.03	–0.14**	0.04
	(0.03)	(0.04)	(0.04)
Proportion vocational	0.11	–0.13	0.28
	(0.15)	(0.28)	(0.23)
Proportion choice	0.04	–0.08	0.12
	(0.06)	(0.11)	(0.09)
Proportion private	0.26*	0.06	0.35†
	(0.11)	(0.23)	(0.18)

(continued)

Table 12.4 *(continued)*

	School SES Segregation		
	Overall	Low-SES Students	High-SES Students
Proportion independent private	0.28*	0.06	0.41*
	(0.12)	(0.25)	(0.19)
Proportion government-supported private	0.02	0.01	–0.004
	(0.14)	(0.25)	(0.21)
Between Countries			
Mean income inequality	0.71**	0.44*	1.20***
	(0.14)	(0.14)	(0.21)
Mean proportion urban	0.11	0.12	0.15
	(0.11)	(0.09)	(0.17)
Mean proportion of cohort enrolled	–0.06	–0.02	–0.14
	(0.09)	(0.08)	(0.15)
Mean school size/1,000	–0.04	–0.01	–0.03
	(0.04)	(0.03)	(0.07)
Mean proportion vocational	0.30†	0.06	0.52*
	(0.13)	(0.13)	(0.22)
Mean proportion choice	0.17**	0.11*	0.22*
	(0.04)	(0.04)	(0.09)
Mean proportion private	0.14†	0.04	0.21
	(0.07)	(0.07)	(0.13)
Mean proportion independent private	0.51	0.14	1.19†
	(0.35)	(0.32)	(0.54)
Mean proportion government-supported private	0.11	0.03	0.14
	(0.08)	(0.06)	(0.13)
Number of observations (country-years)[a]	36	36	36
Number of countries[a]	10	10	10

[a] Exceptions: sample size for urban schools—35 observations, 10 countries; sample size for cohort enrolled—31 observations, 9 countries.

Notes: Overall segregation calculated using rank-order information theory index (H^R). Segregation of low-SES and high-SES students calculated using information theory index for students above and below the 10th percentile (*H(10)*) and the 90th percentile (*H(90)*), respectively. Each pair of within-country/between-country covariates comes from a separate model with no other controls (nine models per outcome). Therefore, the variables related to choice and private schools are not collinear, even though they are subsets of each other, as they come from separate models. Sample size varies slightly across models (see footnote a).

†, *, **, *** = statistically significant at <0.10, <0.05, <0.01, and <0.001 levels.

Sources: Authors' calculations using data from PISA 2000, 2003, 2006, 2009, and 2012. See Table A12.2 and text for sources of country covariates.

low-SES and high-SES students. As expected, countries with higher income inequality tended to have more socioeconomically segregated schools ($p = 0.001$). Over time, however, the relationship between increasing income inequality and increasing segregation appears to be close to 0 and was not statistically significant ($p = 0.82$). Income inequality appears particularly strongly associated with the segregation of high-SES rather than low-SES students. Between countries, income inequality was positively and significantly associated with the segregation of both low- and high-SES students, but it was more strongly associated with high-SES segregation. Within countries, increasing income inequality was significantly associated with *decreasing* low-SES segregation ($p = 0.005$) but was positively—though not significantly—associated with increasing high-SES segregation ($p = 0.18$). Also as expected, urbanization (i.e., a greater proportion of students enrolled in urban schools) generally predicted greater SES segregation, although these associations were never statistically significant.

Turning to educational factors predicting segregation, contrary to expectations, countries with higher proportions of their youth cohort enrolled in secondary school tended to have less segregated schools, although these associations were never significant. Over time, however, countries with increasing proportions of their youth cohort enrolled in school had increasing segregation ($p = 0.008$), as expected. This pattern appears to be dominated by the segregation of low-SES rather than high-SES students, suggesting that these new students entering the system, who were likely to be low-SES, tended to enter schools that were separate from those attended by their middle- and high-SES peers. As expected, larger school size tended to be associated with lower SES segregation between schools, although this association was significant only when predicting changes in low-SES segregation over time ($p = 0.001$). Aligned with our predictions, countries with greater proportions of secondary school students enrolled in vocational tracks had somewhat more segregated schools, and countries with increasing proportions of students in vocational tracks may have had slightly increasing segregation, associations that were marginally significant between countries ($p = 0.06$) but not significant within countries ($p = 0.47$). This finding appears to be driven mainly by the segregation of high-SES students, suggesting that in countries with more vocational education, high-SES students tended to be segregated into academic-track schools.

In regard to educational policies related to school choice and private schooling, as expected countries with a higher proportion of students enrolled in schools of choice (rather than schools with residence-based admissions) tended to have significantly higher levels of segregation ($p = 0.001$). Over time, however, countries with increasing amounts of school choice experienced only slightly increasing levels of segregation, an association that was not statistically significant ($p = 0.52$). Looking specifically at schools of choice that were in the private sector, countries with higher proportions of students enrolled in private schools tended to have somewhat higher segregation, although this association was only marginally significant ($p = 0.09$). Over time, countries with increasing proportions

of students in private schools tended to have significantly increasing segregation ($p = 0.03$), a pattern that appears to be explained mostly by the increasing segregation of high-SES students ($p = 0.07$). Further dividing private schools into those that were independent and privately funded (typically through tuition) versus those that were mostly government supported (such as through vouchers), we found that it was the proportion of students in independent private schools that was most strongly associated with segregation, and particularly with the segregation of high-SES students (presumably those whose families were able to pay tuition). The proportion of students in private government-supported schools was positively but not significantly associated with segregation.

Discussion

This study found that school SES segregation was substantially higher in Latin America than in the United States, a pattern that was largely driven by very high segregation of high-SES students in many Latin American countries, while the segregation of low-SES students in those countries was more similar to that in the United States. However, between 2000 and 2012, the segregation of low-SES students increased more in Latin America than in the United States. The countries with the highest segregation of high-SES students tended to be those with the highest income inequality and/or the largest private school sectors, including Chile, Panama, Uruguay, and Brazil. Countries with the greatest increases in the segregation of low-SES students tended to be those with increasing secondary school access and/or decreasing school size, including Mexico, Peru, and Colombia.

The data available for Chile and the United States in 1970 suggest that there may be a long history of higher school SES segregation in Latin America than in the United States. However, the pattern of particularly high segregation of high-SES students from their middle- and low-SES peers that was very pronounced in the most recent Chilean data was not yet evident in 1970. In fact, our estimates of the segregation of high- and low-SES students based on parental occupation (not reported in the results) show slightly higher segregation for *low*-SES than for high-SES students in Chile in 1970. Between 1970 and 2000, overall school segregation decreased in Chile, but the decline occurred only for low-SES students, while high-SES students became more segregated. This could be due to Chile's sharp rise in private schooling during that period. In 1970, only 21 percent of students were enrolled in private schools; by 2000 that proportion had increased to 46 percent, and by 2012 it had risen to 63 percent (authors' calculations using FISS 1970, PISA 2000, and PISA 2012, respectively). It is important to keep in mind that nearly all of that increase was due to the explosion of government-supported voucher schools following the school privatization reform of 1981. Government-supported private schools existed before the implementation of universal vouchers that year; indeed, they constituted the majority of private schools (authors' calculations using FISS 1970 data). However, those private schools were

very different from the new voucher schools founded after the reform by for-profit organizations to cater to middle-income families who could not afford independent, tuition-supported private schools (Torche 2005). Meanwhile, the number of tuition-supported private schools remained relatively constant and continued to enroll the highest-income students (Torche 2005). Based on Torche's finding that high-income students were most concentrated in tuition-supported private schools and middle-income students were most concentrated in government-supported voucher schools, one would expect that independent private schools would be most associated with the segregation of high-SES students, and that is in fact what we found, both between countries and within countries over time. At the same time, one would also expect that government-supported voucher schools would be most associated with the segregation of low-SES students. We did not find strong evidence for that expectation, however. Although within countries, an increasing proportion of voucher schools was slightly more strongly associated with the segregation of low-SES than of high-SES students, both relationships were close to 0 and not statistically significant.

Thus, when examining change within countries over time, the rise of government-supported voucher schools does not have much explanatory power—perhaps because of limited data, since voucher schools are prevalent only in Chile and Argentina. Increases in tuition-supported private schools were associated with increasing segregation of high-SES students, but recall that the larger change in most Latin American countries since 2000 was the increasing segregation of *low*-SES students. Our models showed that increasing low-SES segregation was related to increasing secondary school access and decreasing average school size. Indeed, both increasing access and decreasing school size are patterns found in most Latin American countries. Two extreme examples are Peru and Mexico. In Peru between 2000 and 2012, secondary school enrollments increased from 66 percent to 78 percent, and the segregation of low-SES students increased from 0.20 to 0.33. In Mexico during the same period, secondary school enrollments increased from 57 percent to 73 percent, and the segregation of low-SES students increased from 0.21 to 0.35. Also during this period, average school size in Peru decreased from about 1,000 students to fewer than 700 students. Average school size did not change appreciably in Mexico, but in another country, Brazil, it decreased from about 1,600 to about 1,000 students, and the segregation of low-SES students increased from 0.25 to 0.28.

Increasing secondary school enrollment and decreasing average school size could be related trends if new schools are opening to accommodate newly enrolled students and these schools tend to be located in remote rural areas and therefore have small enrollments. This might be the case in Peru and Mexico, for example, two of the countries in our sample that have more rural schools and where low-SES students generally attend smaller schools. We could not examine this question directly with the available data, as PISA does not follow schools longitudinally over time or collect information on school founding dates. In ad-

dition, declining school size in Latin America could be related to the expansion of private schooling, as private schools are noticeably smaller than public schools in nearly all Latin American countries. Yet in most countries in our sample, average enrollments have declined within school sectors as well, and declines are even larger in public schools than in private schools. This could potentially be the result of the exodus of high- and middle-SES families from public schools to private schools. Finally, the recent decreases in income inequality seen in much of Latin America do not appear to correspond to lower levels of segregation for low-SES students. On the contrary, low-SES segregation appears to have increased significantly more in countries where income inequality has declined the most.

Overall, the results of this study corroborate earlier findings that school SES segregation is higher in Latin America than in the United States. To this we add that the disparity appears to be growing. By 2012, high-SES students were dramatically more segregated in Latin America than in the United States, but low-SES students were slightly less segregated. If the segregation of low-SES students in Latin America continues to grow, however, the picture for the most disadvantaged students may be the most discouraging. It is difficult to predict the degree to which the current findings regarding school SES segregation reflect differences in residential SES segregation. Because Latin America has such high rates of school choice, school segregation may correspond much less closely to neighborhood segregation in these countries than in the United States. Elementary school segregation, compared with secondary school segregation, might more closely approximate neighborhood segregation, because even in systems of school choice, families tend to prefer to send their younger children to schools closer to home (Flores 2014). Although the current study did not find dramatically different levels of elementary and secondary school SES segregation, no elementary school data were available for the countries with the highest levels of secondary school SES segregation, including Chile, Peru, Mexico, and Panama. In those countries, the contrast between school and neighborhood SES segregation may be particularly stark. The only evidence from previous research comparing residential segregation in the United States and a Latin American country (Mexico) shows that the segregation of low-income households in U.S. cities is much higher than in Mexican cities (Monkkonen 2010). If this finding holds across other Latin American countries, it could be that the reason the between-school segregation of low-SES students is nearly as high in the United States as in Latin America is that low-SES children in the United States actually live in more segregated neighborhoods.

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Table A12.1
Categories of Parental Occupation by Study

PISA 2000–2012		PIRLS 2001, 2011		FISS 1970: Chile		FISS 1970: United States	
1	Elementary Occupations	1	Laborers	1	Unskilled Workers	1	Laborers
2	Skilled Agricultural & Fishery Workers	2	Agricultural	2	Laborers in Agriculture, Forestry, and Fishing	2	Domestic and Personal Service Workers
3	Plant & Machine Operators & Assemblers	3	Plant Operators	3	Semiskilled Workers	3	Farm, Fishery, and Forestry Workers
4	Craft Etc. Trades Workers	4	Craft/Trade	4	Skilled Workers	4	Semiskilled Workers
5	Service Workers & Shop & Market Sales Workers	5	Service	5	Clerical and Sales Workers	5	Skilled Workers
6	Clerks	6	Clerk	6	Policemen and Armed Services	6	White Collar Workers
7	Technicians and Associate Professionals	7	Business	7	Subprofessional and Technical	7	Managers, Officials, and Proprietors
8	Legislators, Senior Officials & Managers	8	Technician	8	Higher Professionals	8	Professional and Technical
9	Professionals	9	Manager	9	Administrators, Executives, Proprietors and Managers		
		10	Professional				

Categories ordered from lowest to highest average occupational status based on the International Socio-Economic Index of Occupational Status (ISEI).
Sources: PISA 2000, 2003, 2006, 2009, 2012; PIRLS 2001, 2011; FISS 1970.

Table A12.2
Descriptive Statistics for Country Covariates

Variable	Source	Mean	Standard Deviation	Number of Country-Years
Income inequality (Gini index)	World Bank (2014), LIS (2014)	0.46	0.04	36
Proportion of students enrolled in urban schools	PISA 2000–2012 principal questionnaires	0.42	0.11	35
Proportion of age cohort enrolled in secondary school	World Bank (2014)	0.74	0.12	31
Average school size/1,000	PISA 2000–2012 principal questionnaires	1.00	0.32	36
Proportion of secondary students enrolled in vocational programs	World Bank (2014)	0.10	0.08	36
Proportion of students enrolled in schools of choice	PISA 2000–2012 principal questionnaires	0.51	0.20	36
Proportion of students enrolled in private schools	PISA 2000–2012 principal questionnaires	0.19	0.15	36
Proportion of students enrolled in independent private schools	PISA 2000–2012 principal questionnaires	0.11	0.04	36
Proportion of students enrolled in government-supported private schools	PISA 2000–2012 principal questionnaires	0.08	0.15	36

COMMENTARY

Tara Watson

This careful and thorough chapter by Anna Chmielewski and Corey Savage examines the socioeconomic status (SES) segregation between schools in Latin America and the United States. The authors' analysis—impressive in scope and quality—documents that countries in Latin America have high rates of SES segregation across schools compared with the United States (and other countries). This makes Latin America a particularly relevant place on which to focus segregation research. Other interesting findings are that Latin America has particularly high segregation between the top and the middle of the income distribution and that segregation has increased in many Latin American countries over time.

The study's key finding raises two important questions: (1) why is segregation higher in Latin America; and (2) should segregation be reduced? The reasons for high Latin American segregation are not well understood. The expansion of secondary school enrollment to socioeconomically disadvantaged and rural youths over recent decades may have increased segregation over time, but it does not explain the high levels of segregation in these countries compared with the United States. Similarly, the low levels (by international standards) of tracking students into academic or vocational schools in Latin America make this an unlikely explanation for its unusually high rates of school segregation.

The authors discuss several likely reasons for this pattern. For example, small schools tend to draw students from more narrowly defined geographic regions, and most countries in Latin America operate small schools by international standards. Small school size could be a cause of school segregation, as the authors hypothesize. However, school size is rightly viewed as a policy choice that could be dictated by higher levels of demand for school segregation by local residents.

School segregation also could arise from neighborhood segregation. There is residential sorting in Latin America, with the affluent concentrated in central cities. No good data on residential location across Latin America are available, however, so the idea that residential segregation is responsible for increased school segregation is not directly testable. But urbanization and inequality, both prominent features of the Latin American context, are linked to neighborhood segregation.

In the United States, research shows a strong link between income inequality and residential segregation by income. As inequality rises, it is easier for the rich to outbid the middle class for the most desirable neighborhoods, and harder for the poor to afford anything other than the least desirable neighborhoods. Watson (2009) has shown that income inequality between the top of the distribution and the middle is associated with segregation between the top and the middle, and that income inequality between the middle of the distribution and the bottom is linked to segregation between those groups. If school assignment

is geographically based, more income inequality will tend to lead to more school SES segregation by income. High levels of income inequality may be part of the Latin American story, but it is important to note that Latin America's declining inequality over the past 10 to 15 years has not manifested itself in declining school segregation.

Using a sample of 204 large U.S. school districts, unpublished work in progress by Tara Watson and Nora Gordon suggests that more residentially segregated districts tend to have more segregated schools on average. However, 65 percent of the sample districts have more segregation between the poor and the nonpoor in schools than would be expected if every student attended the school nearest to his or her home. In other words, school choice, private schooling, or other individual or district decisions can make schools more segregated than neighborhoods. Many districts, by contrast, have substantially less segregation than would be predicted by residential patterns, presumably due to policy decisions that promote integration. In sum, residential patterns are not the sole determinant of school segregation: policies matter.

School choice and private schooling are prevalent in Latin America. Both factors weaken the link between residential location and school assignment. Thus, an alternative possible reason for Latin American school segregation is the extent to which students' schools are divorced from their residential neighborhoods.

The effects of breaking the residence-school link are ambiguous. In a highly residentially segregated area, school choice could act as a force against what would otherwise be a segregated school system. Magnet or charter schools could attract rich students to poor neighborhoods for their schools, or poor students could travel to schools in affluent neighborhoods. Vouchers could allow a disadvantaged student to attend a private school. In the United States, many districts intentionally design school assignment policies to avoid geographically based attendance zones in an effort to promote economic or racial integration. In addition, a system with a very weak link between residential location and school assignment could encourage *residential* integration, because the affluent would have less incentive to cluster in the neighborhoods with the best schools.

By contrast, if wealthy parents are better able to access the opportunities afforded by school choice—perhaps because voucher programs do not fully cover tuition costs or affluent parents are better able to navigate the choice system—such policies could exacerbate segregation. Similarly, distinct educational products offered by charter schools may appeal to families at different income levels, thereby increasing sorting across schools. Finally, school districts that fail to meet the needs of affluent parents will likely lose those parents to private school. It appears likely that Latin American policies tend to promote rather than reduce segregation.

The second question arising from this chapter is, should segregation be reduced? Given the fact that Latin America is an international outlier in terms of segregation levels, there is a prima facie case to be made that the answer is yes. In addition, separate schools are unlikely to offer equal quality, so segregation

reduces equality of opportunity. The high returns to education in Latin America suggest that educational quantity and quality are particularly important to economic success (Patrinos, Ridao-Cano, and Sakellariou 2006).

Furthermore, a segmented educational system may have broader social impacts. For example, a segregated school system may reduce empathy between the rich and the poor, leading children educated under such a system to be less supportive of public goods provision and redistribution as adults. Integrated schools may promote social cohesion. It is important to note, however, that even with the region's high level of school segregation, Latin American residents are on average more willing to redistribute public goods than U.S. residents (Alesina and Giuliano 2009).

Although Chmielewski and Savage do not tackle the question of whether or how to reduce segregation, their findings raise some possibilities. Reducing income inequality would likely reduce residential segregation and perhaps school segregation. However, while a more egalitarian income distribution would probably have benefits, it would be a blunt and politically challenging tool to use in addressing the specific problem of school segregation. Further, the recent declines in Latin American inequality have not translated into reduced economic segregation of schools, perhaps because of the comparatively weak link between residential location and school assignment.

The very high rates of school choice and private schooling in Latin America appear to be contributing factors to the high rates of school segregation. The American experience suggests that carefully considered alternative school choice policies could promote integration. These may need to be coupled with efforts to keep wealthy families in the public education system. The question of whether there is political support for school integration remains unanswered and would be worthy of future research.

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INDEX

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The majority of the world's population now lives in urban areas and depends on urban systems for housing, social services, and economic goods. This number is slated to increase as cities blossom and expand to accommodate new residents, particularly in developing nations. What remains unchanged, however, is the key role of cities as engines of economic growth, social activity, and cultural exchange. The extent to which the needs of urban dwellers will be met depends in many ways on collective policy choices made in coming decades and the character of future urbanization.

In an effort to support the success and sustainability of cities, this volume explores how policies regarding land use and taxation affect issues as diverse as the sustainability of local government revenues, the impacts of the foreclosure crisis, and urban resilience to climate change. This collection, based on the Lincoln Institute of Land Policy's 2014 annual land policy conference, addresses the policies that underlie the development, organization, and financing of the world's cities. Over the years, these meetings have addressed land policy as it relates to a range of topics, including local education, property rights, municipal revenues, climate change, and infrastructure. This is the final volume in the Institute's land policy conference series.

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