How Are Homeowners Associations Capitalized Into Property Values?

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Abstract

Private homeowners associations (HOAs) levy binding fees and provide local services to members. Both should be capitalized into the value of member properties, but the net effect is ambiguous. We construct the most comprehensive, longitudinal database to date on HOAs for Florida and estimate the impact of HOAs on property values. We find properties in HOAs sell at a premium that hovers around seven percent. The premium is strongest immediately following HOA formation and declines over time, suggesting quick capitalization of HOA benefits. Properties in larger HOAs sell for less, as do properties in more stringently-regulated municipalities. Price effects do not depend on the municipality's reliance on property tax revenues but do depend on the city's dedicated expenditures to neighborhood services. Finally, properties located immediately outside of an HOA sell at a premium relative to other non-HOA properties, and this premium marginally increases in size and frequency of neighboring HOAs.

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**The order of the authors alternates across a series of papers and reflects equal contributions.

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How Are Homeowners Associations Capitalized into Property Values?

Section 1: Introduction

Local governments possess the power to tax their citizens, and in return they are expected to provide public goods to residents and businesses within their boundaries. Homeowners associations (HOAs) are institutions increasingly used by municipalities to offload the responsibility of providing local public services onto housing developers. Considerable scholarly attention has been paid towards the effect of the property tax, the local government's most essential taxing tool, on property values, and in the current paper we explore a similar question in the context of HOAs as "private governments." Although not public in nature, and much more limited in their authority and capacity, private HOAs take on similar responsibilities to municipalities and fund them through binding membership fees. Is HOA membership, both the tax it imposes and the benefits it bestows, capitalized into housing values? And if so, does it, on net, depress or inflate housing values?

Membership in HOAs has grown tremendously over the past few decades, with estimates of residents living in an HOA climbing from 2.1 million in 1970 to 62 million in 2010. (Community Associations Institute, 2011). Local municipalities have embraced these associations as a means of downloading certain service and infrastructure responsibilities onto private developers and homeowners. These forms of "private government" have become particularly appealing in times of fiscal stress. Yet, there is very little empirical evidence on their impact on housing markets. The challenge to estimating such an impact is largely driven by lack of data. We construct, using geographic information systems (GIS) software, an electronic map of the homeowners associations and the land parcels that are contained within them for the entire state of Florida. This represents, as we far as we know, the most geographically comprehensive database of HOA membership. This diverse and rich pool of data enables us to look at the impact of HOAs on property values for the universe of HOAs in Florida over nearly a fifty-year period. It is timely for us to undertake a dynamic analysis, for in this era of declining house prices, it is useful to see whether or not HOAs can help homes maintain their value, or whether their additional fees and charges exacerbate the decline.

Results suggest that properties in HOAs sell at a premium compared to non-HOA properties. Specifically, holding other determinants of house values constant, houses that reside in HOAs sell for a seven percent premium over houses that do not reside in HOAs. When the price effect is allowed to vary over time, the HOA premium is immediately larger, but then decreases over time. This suggests that the housing market is quick to capitalize the benefits of the HOA into prices.

We also find that membership in larger HOAs devalues the price of HOA properties, as does residence in municipalities with relatively more regulated land use regimes. Municipal expenditures also matter: HOA properties in jurisdictions with a greater share of expenditures

dedicated towards neighborhood services (but lower expenditures overall) sell at lower prices relative to other HOA properties.

These results suggest that in cities and towns, homebuyers are willing to pay more for HOA properties (and the services they provide) when the local government is dedicating fewer dollars towards neighborhood services (although spending more overall). Finally, properties located immediately outside of HOAs also sell at a premium relative to other non-HOA properties, and it marginally increases in the size and frequency of neighboring HOAs.

The paper proceeds as follows. Section 2 provides the theoretical framework for our analysis, gives a brief overview of homeowners' associations and a discussion of the literature looking at their impact on property values. Section 3 explains the empirical strategy, and Section 4 discusses the data and the construction of the GIS map. Section 5 presents preliminary regression results. Section 6 concludes.

Section 2: Overview of Private Governments and Literature Review

HOAs, and "private governments" more broadly, provide residents with a housing option where they pay for exclusive services that are above and beyond those provided by the local public sector. HOAs are found in planned developments, condominiums and cooperatives. Theoretically, these associations are formed in response to some underprovision or lack of heterogeneity in public services and/or regulation (Helsley and Strange 1998).

Membership in these associations has grown tremendously over the past few decades, suggesting that residents are willing, and able, to pay for additional services, amenities and, in general, more control over their neighbors. The question is whether the perceived benefits of HOA membership outweigh the costs of the additional fee and, for some, the additional layers of regulation. To date, this is still an empirical matter.

We draw from theories on property tax capitalization and land use regulation to shed light on our treatment of HOAs and their impact on property values. The traditional view on property tax capitalization tells us that the HOA fee, which is legally binding like the property tax, will lower the present value of the property and underlying land. Since the HOA is governed by covenants and restrictions that run with the land, this capitalization will be irreversible. According to this perspective, we should expect to see a decrease in property and land values in the presence of an HOA. The benefit view of property tax capitalization, however, predicts that the amenities provided using the property tax revenues will increase the value of the home. HOAs, perhaps even more directly than property taxes, create a nexus between the fee and the services provided. This perspective suggests an alternative outcome: any negative capitalization of the HOA fee should be compensated by benefits generated by the supplemental HOA services. Together, the net effect on property values is ambiguous.

Adding yet another layer is the regulatory nature of HOAs. HOAs do not possess the comprehensive authority of a general-purpose government, but they do participate in zoning-like activities that restrict the use and physical appearance of their member properties. In addition,

their covenants stipulate voting schemas that delegate power differentially across members of the HOA depending on the size or value of their homes; this voting structure is then the deciding factor in the current and future restrictiveness of the governing use and building regulations. As with the HOA fee, these covenants and restrictions can be viewed as both a tax and a benefit for the homeowner. On the one hand, HOA restrictions impose regulatory obstacles to making improvements to one's home or engaging in certain activities within the boundaries of the association. In this way, the HOA acts like a regulatory tax by imposing costs that depress the value of the property. Alternatively, HOA regulations can reduce the degree of risk associated with buying into the neighborhood and impose controls over the local community that can even be seen as an amenity. Again, the net effect on property values is ambiguous.

Because HOAs are now such a popular method for cities and developers to fund local public services, it is important to quantify the impact that HOA membership has on housing prices. Notwithstanding this, however, the economic literature linking HOAs and house prices is nearly non-existent. The primary challenge to this empirical research is data. Because of the private nature of HOAs, there is little, if any, reporting requirement. Generally, most states require that the board of the HOA be incorporated and to file documents of incorporation, but this falls far short of oversight by any regulatory agency. Therefore, little is known on the mere number of HOAs, let alone on their size, yearly budgets and assessments.

To get around the data issue, most studies rely on novel data on HOAs, often collected through manual examination of records, to determine which parcels in a locality belong to an HOA. This is then merged into the sales data (either from real estate listings or property tax records).

The most extensive examination of this type is Groves (2008), who uses a dataset of 124,878 property sales in the St. Louis area in a hedonic analysis. While he finds that homes that belong to an HOA indeed sell for more than homes that do not belong to an HOA, this premium disappears when finer characteristics of the homes are controlled for. Groves argues that this is evidence that the homogeneity of homes within HOAs hides any positive gain from living in an HOA.

In the same vein, LaCour-Little and Malpezzi (2001) and Bible and Hsieh (2001) both look at the impact of being located in a gated community on property values. The results from both studies show that homes located inside gated communities are significantly higher than comparable homes outside the gated communities. Neither of these studies, however, uses longitudinal data that can control for price differentials before the establishment of the homeowner association or gated community.

There are also a handful of studies looking at the relationship between the regulatory role of HOAs and house prices. Most of the studies to date use data on restrictive deeds and covenants for a sample of homes in a single municipality. Rogers (2006) runs cross-sectional hedonic regressions, controlling for spatial autocorrelation, to estimate the impact of Residential Community Associations' (RCAs) regulations on house prices, and produces mixed results. On average, RCAs generally and their use restrictions specifically are associated with higher house prices; building restrictions (covering architecture or easements), on the other hand have no significant effect on house prices. In addition, voting rules of 80% generate the most value and

mortgage-holder voting rights dampen values. His results suggest that RCAs do provide some regulatory value that is perhaps underprovided by the local government; that is, residents are willing to pay more for control over current and future neighborhood restrictions.

Similar to Rogers, Hughes and Turnbull (1996) run hedonic regressions to estimate the effect of restrictive deeds and covenants on house prices. They use a sample of 1,314 single-family detached house sales from 37 neighborhoods with covenant and deed restrictions in Baton Rouge, Louisiana, and they control for observable house and neighborhood characteristics over a seven-year period. They find that stricter land use control overall increases house prices, suggesting that the reduced uncertainty from these restrictions is capitalized into the house prices. Speyrer (1989) uses a similar estimation approach, but compares the effect of zoning to that of covenants on house prices in Houston. She also finds a positive effect, and specifically a $4,800 to $5,900 premium (evaluated at the mean).

Section 3: Model

Baseline

In order to test whether HOA membership affects property values, we undertake a hedonic valuation analysis, in the style of Rogers (2006). Our sample, however, is substantially larger than most existing studies, both in number of observations over time and in geographic scope. The level of observation is the parcel; specifically, we retain only parcels that are part of a subdivision, in order to enhance the comparability of the HOA and non-HOA properties. In addition, we eliminate all properties that were constructed prior to 1960 (which corresponds with the establishment of the first HOA) in order to ensure comparability in property vintage across the sample.[1]

We then divide our sample into parcels that lie in incorporated municipalities (cities, towns and villages) and parcels that lie in unincorporated county areas. Throughout the paper, we estimate the regression models for these two samples separately. This is motivated both by the aim to minimize the burden of computation and also by the fact that smaller jurisdictions and larger counties have different regulatory and taxing powers that could differentially influence the likelihood of HOA formation and the capitalization of their amenities into property values.

However, because many of our results are qualitatively similar across the two samples, we focus our analysis on the municipality sample, and we only present and discuss the unincorporated sample in instances where the results differ substantially.[2]

[1] We also run all models excluding properties built prior to 1980 (in order to narrow the vintage range even more), and excluding sales of parcels transacting after 2006 (in order to avoid complications from recent housing market volatility). The results from these regressions are substantively identical to those presented in the paper and are available from the authors upon request.

[2] All the regressions run on the county sample are available from the authors upon request.

We estimate the following regression equation:

$$\ln P_{ijct} = \beta_0 + \beta_1(\boldsymbol{X}_{it}) + \beta_2(\boldsymbol{HOA}_{it}) + d_j + d_{c,t} + \varepsilon_{it},$$

Where P_{it} represents the real sales price (2008 dollars) for a property i at time t; $\boldsymbol{X}_{it}$ is a vector of property characteristics for property i at time t; $\mathbf{HOA}_{it}$ is a vector of HOA variables indicating whether or not the parcel resides in an HOA and when the sale of the parcel took place relative to HOA formation.

For the variables in $\boldsymbol{HOA}_{it}$, we first include a variable, *HOA_ever* which takes on the value of 1 if a parcel is ever in an HOA at any point during the study period; the coefficient on this variable can be interpreted as the difference in price between HOA and non-HOA parcels.

Second, we include a continuous linear trend variable, *HOA_trendpost*, which captures the price trend of HOA parcels after HOA formation, relative to non-HOA properties on average. We also include, in a separate regression, a set of three discrete trend variables that measure non-linearities in price differences over time.

Third, we interact *HOA_ever* with *HOA_size*, in order to allow the price effect to vary with the size of the HOA. *HOA_size* is operationalized as the total number of parcels in the HOA, which will pick up the physical scale of the association and also reasonably proxy for the scale of services and amenities.[3]

Finally, we include d_j, jurisdiction fixed effects, in our regression so that the average price of properties inside of HOAs is compared to the average price of properties outside of HOAs, but within the same jurisdiction, both before and after HOA formation. Finally, the $d_{c,t}$ are a set of county-year dummies to control for unobserved heterogeneity across jurisdictions and in the larger county over time.[4]

Interactions with Land Use and Fiscal Variables

As discussed above, HOAs typically form in response to the level or nature of the public sector's service provision and/or regulation. In order to better understand whether HOAs are more or less valued in jurisdictions with varying service and regulatory regimes, we include in the model jurisdiction-level variables that measure fiscal revenue and spending and land use management practices. For our analysis, we measure the regulatory taste of a jurisdiction by creating an index of land use management practices.

We rely on responses to a survey (described in the next section) in which planning officials were presented with nineteen different land management techniques (for example, incentive zoning, historic district zoning, large lot zoning and impact fees) and asked to indicate which ones were used in their jurisdictions within the last 24 months. We create a variable, *LandUseCount*, which

[3] Ideally we would like to have information on the budget, services or amenities offered in the HOAs, but this data is unavailable.

[4] In the regressions for parcels in unincorporated areas, we include a set of county fixed effects and a set of year fixed effects.

is simply a count of how many of the nineteen techniques the survey respondent said were used.[5] We therefore make the assumption that a higher value for this variable indicates a stronger taste for regulation in the jurisdiction. We also recognize that zoning is not monolithic and can take the form of regulation that is more or less developer-friendly. We address this variation by creating two sub-indices of land use management: *Flexible*, which is a count of how many "pro-development" techniques are in use; and *Inflexible*, a count of how many "anti-development" techniques are in use.

In addition, we include four measures of municipal fiscal behavior. First, we use *Prop_Tax_percap*, which measures the per capita property tax revenues and proxies for the real-estate-based fiscal "cost" of living in a particular jurisdiction. Since HOA fees are akin to property taxes, when interacted with *HOA_ever*, this variable tests whether or not HOAs go hand-in-hand with otherwise "expensive" places to live (or whether their fees are layered onto otherwise more affordable fiscal regimes).

Second, we include *Prop_Tax_share*, which measures the share of general revenues raised from property taxes. This variable proxies for the extent of local fiscal control and when interacted with *HOA_ever* tests whether or not HOAs are a means to enhance localized control in otherwise fiscally tied municipalities.

Third, we interact *HOA_ever* with *Direct_Expend_percap*, which measures the amount of per capita expenditures and proxies for the degree of general municipal spending. The coefficient on this interaction term will test whether or not HOAs are a method to privately supplement services in more spendthrift municipalities.

Finally, we include *Share_Service_Expend*, which is calculated as the share of expenditures dedicated towards police, waste removal and park services (i.e. services that reflect typical HOA responsibilities). This offers a more precise test of the above theory; that is whether or not homebuyers are willing to pay a premium to receive private services in the context of municipal service packages.

In addition to the baseline regression presented above, we individually interact *HOA_ever* with each of these land use and fiscal variables and estimate the following regression equation for each interaction:

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[5] *LandUseCount* is created by counting the number of "Yes" responses to the following question in the 2006 DeVoe Moore Center Land Use Survey: "Which of the following Land Use Management Techniques have been used by your jurisdiction in the last 24 months? (Please check all that apply)" The nineteen possible responses are: mixed-use development*; incentive zoning*; historic district ordinance**; floodplain zoning**; tree protection ordinance**; large lot zoning**; severe slope regulation**; open space zoning**; land acquisition for public use**; performance zoning; zero lot line housing*; form-based zoning; transfer of development rights*; inclusionary zoning*; conservation subdivision ordinance**; cluster development*; acquisition of conservation easements**; requirement of natural features inventory**; impact fees**.
The sub-index *Flexible* counts only the policies marked with one asterisk; *Inflexible* counts only the policies marked two asterisks. Policies with no asterisks were judged to have ambiguous effects on regulatory stringency and so are not include in either sub-index.

$$\ln P_{ijct} = \beta_0 + \beta_1(\boldsymbol{X}_{it}) + \beta_2(\boldsymbol{HOA}_{it}) + \beta_3(\boldsymbol{HOA}_{it}*Regime_j) + d_j + d_{c,t} + \varepsilon_{it}$$

Spillover Effects

Even though membership in an HOA is explicitly conditioned on paying the membership fee, the benefits may not be as clearly allocated. For example, properties located immediately outside may benefit from the security and landscaping without paying the price of membership. On the other hand, crime averted inside an HOA may be diverted to houses immediately outside.[6]

We test for these spillover effects by adding to the baseline regression a dummy variable, *parcel_spill*, which takes on the value of 1 if the parcel is located within ½ mile of the HOA border and 0 otherwise. In addition, we test for differential effects depending on the average size of the neighboring HOAs (*parcel_spill_HOAsize*) and the total number of neighboring HOAs (*parcel_spill_nHOA*). The amended regression equation is the following:

$$\ln P_{ijct} = \beta_0 + \beta_1(\boldsymbol{X}_{it}) + \beta_2(\boldsymbol{HOA}_{it}) + \beta_3(\boldsymbol{HOA}*Spillover_{it}) + d_j + d_{c,t} + \varepsilon_{it},$$

Section 4: Data

A Map of HOAs in Florida

The fundamental obstacle to rigorous empirical work on HOAs is the paucity of reliable, accurate HOA data. Studies have either compromised by using (or building) datasets that are geographically narrow in scope (Groves, 2008), limited in observations over time (Rogers, 2006, LaCour-Little and Malpezzi, 2001; Bible and Hsieh, 2001), or non-spatial (Cheung, 2008b).

We first begin by constructing a data set of all HOAs in Florida and the land parcels that are contained within them. Florida has obvious advantages for such an analysis: it has one of the highest numbers of HOAs in the United States (over 16,000 as of 2010), and its municipalities are relatively diverse in terms of density and demographic and economic composition.

Information on Florida HOAs was obtained from Sunshine List, a private, Florida-based corporation that has compiled the most comprehensive and up-to-date list of HOAs in the state. This dataset includes information on the location and creation date of every active HOA in Florida as of 2008 (the first HOA was incorporated in 1959).[7] This company compiles a list of all the HOA officers in the state for the purposes of marketing to service providers (lawyers, accountants, landscapers, etc.) Each entry includes information on an officer who sits on the board of the HOA, a unique HOA identification number, the officer's address and the incorporation date of the HOA. We geocode, using geographic information system (GIS)

[6] This hypothesis is examined in Helsley and Strange (1999).
[7] HOAs are rarely, if ever, dissolved.

software, the reported addresses of the officers onto an electronic parcel map of the state obtained from the Florida Department of Revenue.

The next step is to define the HOA boundaries. Unfortunately, the dataset does not indicate how many residential parcels are in each HOA, and so there is no way to identify the exact size of the HOA. However, since HOA officers generally live in the HOA they serve, we make the following strong working assumption: if we know that a parcel of land belongs in an HOA because an officer lives there, then *all parcels in the same subdivision* belong to the same HOA. We believe that this assumption is reasonable because of the fact that housing developers who plat subdivisions are, by and large, the creators of HOAs (Rogers, 2006; Hughes and Turnbull, 1996; Roland, 1998). We contacted each county's property assessor or GIS department and requested the electronic map of all the platted subdivisions in the state. All but a few counties responded. We then overlaid the subdivision map on top of the parcel map and located the subdivisions that intersected with the address of an officer. Each of these is considered an HOA, and by counting the number of residential parcels that intersect the subdivision, we can obtain the number of housing units in the HOA.

We note a caveat to our approach. The address of an officer in our dataset is self-reported, and there are two potential reasons why the address might not be the actual residence of the officer. First, the officer may have put the HOA's management office as his or her address. Second, the officer uses the HOA unit as a second or vacation home or rents it out. We have devised an algorithm to identify these suspect HOAs, and we are forced to drop them from our sample.[8] We are confident that our assumptions are reasonable and, if anything, err on being conservative in terms of determining the scope of HOAs in the state. Our result is the most comprehensive electronic map of HOA activity, covering virtually the entire state of Florida.

Property Characteristics Data

We supplement our HOA map with data for property sales and property characteristics, which come from the Florida Department of Revenue's electronic parcel map. This map is compiled annually by each of the county's property assessors. Every parcel is identified uniquely within the county by parcel ID. For each parcel, we observe some physical characteristics such as size of lot, number of units, number of buildings, building classification (in this case, single-family or condominium), age of structure, square footage of the structure and livable area and vacant status. We also observe the *last two* sale dates of the property and the corresponding sales prices.

Land Use and Fiscal Regime Data

The land use variables *LandUseCount, Flexible* and *Inflexible* are derived for a subset of jurisdictions from a survey conducted by Florida State University's DeVoe Moore Center in which they collected information on the nature and extent of land use management practices as

[8] We will not elaborate on the algorithm here, but briefly here is a non-exhaustive list of reasons that would cause us to reject an address as being the actual location of an HOA: (1) address reported is zoned commercial; (2) identical addresses are reported for more than one HOA (this is likely an office building); (3) address belongs to a different city from the other officers in the same HOA.

of 2006. City and county planning officials were contacted and surveyed on which land use management techniques were used in their jurisdiction. This survey represents one of the most recent, detailed and statewide explorations of land use techniques available. Because not every municipality in the state responded to the survey, the sample size in specifications that include the land use control variables is smaller.

Finally, we obtain the fiscal revenue and spending variables from the 2007 Census of Governments.

Description of Data

For our initial regressions, our data covers 44 of 67 counties in Florida. We dropped counties from the analysis either due to incomplete data (primarily from missing subdivision and/or GIS parcel files) or due to lack of variation in HOA membership. Ultimately, our data covers over eighty percent of the state population. Thus, we still retain the most populous parts of the state, which does not cause us much concern for the validity of our dataset.

We use only single-family and condominium, residential parcels that are part of subdivisions. About 95 percent of the sample is comprised of single-family homes. This distinction is controlled for in the regression analysis. We also eliminate any repeat sales that take place within one year of one another (to assure arms-length sales and avoid those with unusually quick turnover) and all sales valued at less than $10,000 and more than $1,000,000 (to remove outliers at the top and bottom percentiles).

Our entire working dataset consists of 1,613,975 (parcel-year) observations total, with sales dates extending from 1960 to 2008. The incorporated jurisdiction dataset contains 596,791 parcel-year observations and the unincorporated county dataset contains 1,017,184 parcel-years. The average incorporated jurisdiction has 2,313 parcel-years, and the average county jurisdiction has 23,118 parcel-years.

Summary statistics of other parcel characteristics are displayed in Tables 1 and 2, and they already illustrate significant differences across HOA and non-HOA parcels (all of the differences in means are significant at $P < .01$ unless otherwise noted). We see that HOA parcels are more expensive ($224,662 compared to $196,311 in incorporated jurisdictions and $206,600 compared to $177,002 in county jurisdictions) and larger (close to 2,126 square feet in living area compared to just under 2,000 square feet in incorporated jurisdictions and 2,295 square feet compared to just over 2,000 square feet in county jurisdictions). HOA properties also exhibit more variation in sales price than non-HOA properties. HOA parcels are only slightly less likely to be single-family homes (versus condominiums) and they are built, on average, more recently. HOA properties also tend to form in jurisdictions, of any kind, that are more regulated (a higher *LandUseCount*).

In terms of fiscal environments, HOA properties in unincorporated county areas tend to reside in counties with lower property tax revenues (both per capita and as a share of total revenues) than those where non-HOA properties reside. The same is true of HOA properties in incorporated

jurisdictions, relative to non-HOA properties. Compared to non-HOA properties in unincorporated county areas, HOA properties tend to reside in counties with lower per capita expenditures, but with a slightly higher share of expenditures dedicated towards local services like policing, waste removal and park improvement (all services that HOAs typically engage in). The opposite is true of per capita expenditures for HOA properties in incorporated jurisdictions, relative to non-HOA properties; the share of expenditures dedicated towards local services is not significantly different across HOA and non-HOA properties.

HOAs in Florida

Like trends for the rest of the country, HOAs in Florida have proliferated over the past thirty years and during the past decade in particular. Chart 1 provides evidence of this. The first recorded HOA was established in 1959, and since 1990, the number of HOAs in Florida has increased by nearly 140 percent. To put this in context, the number of new housing units in Florida has increased by 14 percent during the same period and the number of units in HOAs nationwide has increased by about 50 percent (Community Associations Institute, 2008).

Chart 2 illustrates the more recent proliferation of HOAs: newer HOAs are spreading across many jurisdictions (even though the places with older HOA presence tend to have more HOAs). HOAs, however, are not evenly distributed across the state of Florida.

Finally, as the maps in Figure 1 illustrate, they have primarily emerged along the coasts, and increasingly in the central peninsula and pockets of the northern panhandle. As expected, they are most prevalent in the central and suburban parts of the state, where developable land is abundant. The number of HOAs in a particular jurisdiction varies considerably; as of 2008, some places had only one HOA while others had 300 or more. In practice, HOAs are more common in the unincorporated portions of the county than in municipalities; Orlando, for example, has 139 HOAs, while Orange County has 424. About 18 percent of our sample consists of parcels in HOAs with an average formation year of 1990 for incorporated jurisdictions and 1989 for unincorporated county areas.

Section 5: Regression Results

Baseline

As mentioned above, we run regressions for incorporated jurisdictions and unincorporated county areas separately. First we summarize the results for the incorporated jurisdictions, all displayed in Table 3. All models include jurisdiction fixed effects and county-year dummy variables. The first column displays the model with only property covariates on the right-hand side in order to verify the validity of our base hedonic model. These all have generally accepted signs. The sales price of a house is positively associated with larger lot size, better improvement quality and more square footage. More recently built houses have higher sales prices, and vacant lots sell for substantially less than improved lots. In the second column, we add in *HOA*_ever to

measure the impact of HOA membership on sales price. We see that there is a positive and highly significant association between HOA membership and property value. Specifically, properties in HOAs sell at prices about 6.6 percent higher than those not in HOAs. Based on the mean sales price in the sample, the price premium for HOA membership amounts to about $13,171 on average per parcel; not an exorbitant premium, but also not a minuscule amount.

In the third column we allow the price effect to vary over time. The coefficient on *HOA_ever* is still significant and increases up to .10; the coefficient on *HOA_trendpost* is also highly significant, but negative. This suggests that although HOA properties do sell at a premium relative to non-HOA properties, this differential decreases over time (and specifically at about 0.4 percent per year). The particular model will serve as our baseline regression moving forward.

In the next specification, we test for non-linearities in the effect of HOA membership over time, by replacing the continuous *HOA_trendpost* with three discrete time-since-formation dummies: HOA formed 0 to5 years ago; formed 5 to 15 years ago; formed over 15 years ago. The declining pattern of the coefficients corresponds to the negative continuous trend, and suggests that it takes at least 15 years after HOA formation for the premium to dissipate.

In the final specification of Table 3 we return to our baseline specification and also interact *HOA_size* with *HOA_ever* to test whether the size of the HOA differentially affects price. The coefficient on the interaction is negative and highly significant (albeit very small in magnitude), suggesting that properties in relatively larger HOAs (as measured by the number of member parcels) sell at a lower price. Although larger HOAs most likely have more amenities and services (which would theoretically demand a price premium), they could potentially be less exclusive and/or intimate, both of which might disincentives for homebuyers. Larger HOAs might also offer less control over internal rules and services for the individual homeowner, which again could devalue the property relative to other HOA properties.

We now turn to the regression results for the parcels located in unincorporated county areas. Since unincorporated county areas consist of parcels that are not part of smaller, incorporated jurisdictions, they are subject to less localized regulatory and tax regimes; both of these factors can determine property values and the likelihood of HOA formation. For example, HOAs may be more likely to form in unincorporated area since they do not have more geographically bound local governments to meet their service needs, and the population's demand for public services may be more heterogeneous. Indeed, there is a greater share of HOA parcels in unincorporated county areas, compared to incorporated jurisdictions (24 percent compared to 19 percent).

Table 4 displays the county regression results, and we proceed through the same sequence of specifications as above. The first column displays the hedonic model only, and as before, all of the hedonics have generally accepted signs. In the second column, we see, again, that there is a positive and highly significant association between HOA membership and property value. Specifically, properties in HOAs sell at prices about 7 percent higher than those not in HOAs. This is very similar to the estimate for the parcels in incorporated jurisdictions. Based on the mean sales price in the sample, this total differential amounts to about $12,846 on average per parcel; again, not a negligible amount.

In the third column of Table 4, we allow the price effect to vary over time. The coefficient on *HOA_ever* is still significant and increases to 0.110; the coefficient on *HOA_trendpost* is again highly significant and negative. As before, HOA properties do sell at a premium relative to non-HOA properties, but this differential decreases over time (and specifically at 0.4 percent per year). The fourth specification shows a similar declining non-linear price effect, where, as before, the premium dissipates after 15 years post-HOA-formation. In the final specification we interact *HOA_size* with *HOA_ever*. The coefficient on the interaction is negative and highly significant (but also very small in magnitude), again indicating that properties in relatively larger HOAs sell at lower prices.

Interactions with Land Use and Fiscal Variables

We now incorporate variables on the municipal land use and fiscal environments, and these results are displayed in Tables 5 and 6.[9] We begin with the land use models in incorporated jurisdiction in Table 5. The first column displays the baseline model from Table 3 for reference, and the second column displays the results when we interact *HOA_ever* with a measure of overall land use regulation, *LandUseCount*.[10] The coefficient on the interaction is negative and highly significant, suggesting that HOA properties in jurisdictions with relatively more regulation sell at relatively lower prices than HOA properties in less regulated environments.

This finding suggests that within municipalities that already possess layers of regulation, homebuyers are not willing to pay more for another layer of HOA-imposed rules and regulations. This could demonstrate some distaste for additional regulation, but it could also indicate that the public sector is to a certain extent satisfying the regulatory demands of the residents without the need for private supplementation.

The next two columns disaggregate this measure of regulation into *Flexible* and *Inflexible*, or the extent to which the jurisdiction imposes regulations that are development friendly. The coefficient on the interaction with *Flexible* is negative and significant, while the coefficient on the interaction with *Inflexible* is positive and significant. Together, these indicate that HOA properties are more valuable should they sell in jurisdictions with less development friendly land use regimes.

This distinction reveals a bit more nuance in the HOA "premium": it appears that homebuyers actually do layer HOA regulation on top of the municipality's land use regime, but only in cases where the underlying regulation is more rigid. Homebuyers will pay a premium to live in an HOA in jurisdictions with regulation that hinders development (but not with regulation that encourages development), and this implies a preference for increased control over one's surrounding land use environment (control that is secured by both the public and private regulatory regimes).

[9] We do not present models including land use and fiscal variables for the unincorporated county areas. Since the fiscal and land use responsibilities of county areas can vary tremendously (both across counties and within them), we rely solely on the incorporated jurisdiction results to inform hypotheses related to public sector interactions.
[10] Recall that the sample size decreases because many cities did not respond to the Land Use Survey.

Next we discuss the results for the models that include municipal revenues and expenditures. Table 6 displays the results, and as before, the first column shows the full baseline specification for reference. In the second and third columns, *HOA_ever* is interacted with measures of property tax revenue, and neither is significant. The last two panels display results for models that interact *HOA_ever* with measures of public expenditures, and both produce significant coefficients on the interaction term. Specifically, there is a price premium for HOA properties that are located in jurisdictions with higher direct expenditures per capita. HOA properties in jurisdictions with larger shares of expenditures dedicated towards services pertaining to police, waste removal and parks, however, sell at *lower* prices relative to other HOA properties.

Therefore it is not only the general spending behavior of the locality that matters (and here it appears that HOAs are a complement to relatively high-spending municipalities), but how much is being dedicated towards services that might overlap with HOA responsibilities. HOA properties are less desirable in places where the public sectors is already dedicating a relatively larger share of its expenditure budget towards related services (hence making homebuyers less willing to pay for supplemental private services from the HOA). This result accords with the finding by Cheung (2008b) that municipal governments in California respond to the growing influence of HOAs by lowering their spending on privately-substitutable services like police, waste removal and parks. It adds further to the view that HOAs are effectively acting as substitutes for local government in the delivery of public services.

Spillover Effects

Finally, we turn to the regression results for the specifications that control for parcels located immediately outside the HOA borders. Table 7 displays the results for incorporated jurisdictions, with the baseline regression in the first column for reference. In the second column, the model includes a dummy for whether or not the parcel lies within ½ mile of the HOA border. The coefficient on *parcel_spill* is positive and highly significant. However, the premium, relative to other non-HOA properties, is about half the size of that for parcels located inside of the HOA. In other specifications (not shown here), we find that about 25% of the premium is induced by HOA formation; most of it is a reflection of a price differential pre-HOA formation.

Next, we test for variation in spillover effects, depending on the frequency and size of the neighboring HOA(s). In the third column, we interact *parcel_spill* with the average size of the neighboring HOAs (*parcel_spill*HOAsize*) for any parcel within ½ mile of at least one HOA. The estimated effect is negative and significant (but small in magnitude). Any spillover premium is reduced by less than 0.1%. However, when *parcel_spill* is interacted with the number of neighboring HOAs (*parcel_spill*nHOA*), the effect is larger and positive.

Finally, we test for the influence of size and frequency simultaneously (*parcel_spill_HOAsize*nHOA*). We find that spillover parcels located near a higher number of relatively *bigger* HOAs generate, on net, a price premium. These findings indicate that it is not

simply a crude HOA effect, but that the characteristics of the neighboring HOA(s) matter as well.[11]

Section 6: Conclusion

As more and more local jurisdictions struggle with strained budgets and limited revenues, the appeal of offloading public service provision onto private housing developers is growing. In return for fees, homeowners associations provide residents with supplemental public services and tighter land-use control. While anecdotal evidence and popular perception suggests that HOAs protect property values by maintaining uniformity and guaranteeing a minimum level of targeted services and amenities, there is little empirical evidence on the capitalization of HOA benefits into property values.

In this paper, we construct the most comprehensive, statewide electronic map and database of homeowners associations to date. By tying in accurate assessor and property tax information, we can see how membership in an HOA affects property prices, and ultimately, the public fisc. These findings are particularly relevant in times of fiscal stress, when municipalities might be eager to raise local revenues (and defer local expenses).

Our findings suggest that properties in HOAs sell at a premium compared to non-HOA properties, and this is persistent across various specifications for incorporated jurisdictions and unincorporated county areas. Specifically, houses that belong to HOAs sell for, on average, a seven percent premium over houses that do not reside in HOAs. In addition, HOA properties in larger associations tend to sell for less. When the price effect is allowed to vary over time, the premium is immediately larger, but then decreases over time. This suggests that the housing market is quick to capitalize the benefits of the HOA into prices.

We also find that municipal land use and fiscal regimes matter in the degree and direction of capitalization. First, HOA properties in municipalities with relatively more regulated land use regimes sell at lower prices than other HOA properties. Second, in incorporated cities and towns, homebuyers are willing to pay more for HOA properties (and the services they provide) when the local government is dedicating *fewer* dollars towards neighborhood services (although spending more overall). This suggests that a degree of substitutability is present (and visible) between city governments and HOAs.

Finally, properties located immediately outside of the HOAs seem to benefit as well: they too sell at a premium relative to other non-HOA properties, although the magnitude is much smaller. This premium marginally increases in the number and size of the neighboring HOAs.

[11] The takeaways from the regressions on unincorporated county areas are consistent with those in the jurisdiction results. The spillover effect appears to be larger in unincorporated county areas (relative to the premium associated with HOA membership in unincorporated county areas and relative to the premium associated with spillover parcels in incorporated jurisdictions). In addition, while the individual effect of neighboring HOA size and frequency echoes that in incorporated jurisdictions, the simultaneous effect is null. These results are available from the authors upon request.

In sum, HOAs appear to be a boon to the local fisc, both in the tax revenues they can bring in and the service responsibilities they can assume. And while members exclusively benefit from HOA services and amenities, the non-HOA neighbors also see returns in the form of price premiums (and without paying an HOA fee). HOAs can thus presumably confer benefits beyond their borders.

However, what still remains unclear is why homebuyers will pay such a premium to live in these associations. Is it primarily about the services and amenities they provide? The results showing that HOA size can actually cut into the price premium suggest that this might not be the case. To the extent that the nature and quality of services is correlated with HOA size, then our findings suggest that homebuyers are actually willing to pay higher prices for more intimate communities. Is the premium then more about retaining close control over rules and regulations or maintaining more close-knit (perhaps more homogeneous) communities?

Our finding that HOA properties are priced at a premium in relatively more regulated municipalities suggests that there is a correlation between HOA membership and a preference for regulation or control.[12] Our analysis demonstrates that HOA membership is valued in the marketplace, but future research and more detailed data will help uncover the mechanisms behind this premium.

[12] We also find evidence of HOAs reflecting a desire for local neighborhood control in Cheung & Meltzer (2010).

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Table 1: Summary Statistics of Key Variables, Incorporated Jurisdictions

	non-HOA property	HOA property	non-HOA property	HOA property	non-HOA property	HOA property	non-HOA property	HOA property
Variable	**Mean**		**Std. Dev.**		**Min**		**Max**	
Characteristics of HOA where parcel resides								
HOA formation yr		1990		8.59		1961		2008
HOA Size (# parcels)		363		640		1		2,969
Characteristics of parcel								
Sales price ($2008)	196,311	224,663	149,561	158,814	10,000	10,000	1,000,000	1,000,000
Year Built	1986	1994	13	10	1960	1960	2009	2009
# Buildings	1.13	1.06	0.47	0.30	1.00	1.00	17.00	7.00
Total Sq. Feet of Lot (1000s)	11.252	9.937	15.062	12.565	0.230	0.435	1,095.031	488.308
Total Sq. Feet of Living Area (1000s)	1.999	2.126	0.924	0.902	0.224	0.270	19.488	19.332
Vacant	0.07	0.08	0.25	0.28	0.00	0.00	1.00	1.00
Single-Family	0.98	0.98	0.13	0.15	0.00	0.00	1.00	1.00
Improved quality	0.73	0.49	1.33	1.16	0.00	0.00	6.00	6.00
Characteristics of jurisdiction where parcel resides								
Land Use Count	3.78	4.75	4.64	4.85	0.00	0.00	14.00	14.00
Property Tax per cap '000s ($2007)	0.40	0.37	0.29	0.25	0.00	0.00	9.24	2.04
Share Prop Tax Revenues	0.23	0.22	0.09	0.08	0.00	0.00	0.74	0.63
Expenditures per cap '000s ($2007)	2.33	2.19	1.36	1.36	1.33	0.20	30.83	6.44
Share Expend on Services	0.25	0.25	0.12	0.12	0.10	0.00	0.72	0.63
N	502,852	93,939						

Notes: all difference in means significant at p<.001; Improved quality measured on 1-6 scale, ranging from minimum to superior.

Table 2: Summary Statistics of Key Variables, Unincorporated County Areas

	non-HOA property	HOA property	non-HOA property	HOA property	non-HOA property	HOA property	non-HOA property	HOA property
Variable	**Mean**		**Std. Dev.**		**Min**		**Max**	
Characteristics of HOA where parcel resides								
HOA formation yr		1989		9.19		1959		2008
HOA Size (# parcels)		341		749		0		4,319
Characteristics of parcel								
Sales price ($2008)	177,002	206,600	122,604	136,924	10,000	10,000	1,000,000	1,000,000
Year Built	1987	1993	12	9	1960	1960	2009	2009
# Buildings	1.15	1.04	0.48	0.24	1.00	1.00	12.00	8.00
Total Sq. Feet of Lot (1000s)	16.090	15.792	81.077	87.514	0.209	0.348	10,405.150	2,742.380
Total Sq. Feet of Living Area (1000s)	2.073	2.295	0.922	1.037	0.216	0.256	32.384	37.912
Vacant	0.11	0.11	-	-	0.00	0.00	1.00	1.00
Single-Family	0.97	0.92	-	-	0.00	0.00	1.00	1.00
Improved quality	0.56	0.51	1.16	1.24	0.00	0.00	6.00	6.00
Characteristics of jurisdiction where parcel resides								
Land Use Count	3.82	4.92	5.00	5.01	0.00	0.00	14.00	14.00
Property Tax per cap '000s ($2007)	0.57	0.57	0.15	0.16	0.04	0.04	1.01	0.99
Prop Tax Share of Revenues	0.29	0.30	0.09	0.08	0.06	0.06	0.50	0.48
Expenditures per cap '000s ($2007)	2.18	2.03	0.91	0.87	0.55	0.55	3.53	3.53
Share Expend on Services	0.20	0.20	0.07	0.07	0.13	0.12	0.41	0.41
N	820,286	196,898						

Notes: all difference in means significant at $P < .001$ with the exception of "Vacant", which is insignificant; Improved quality measured on 1-6 scale, ranging from minimum to superior.

Table 3: Baseline regression results, Incorporated Jurisdictions

Dep. Var. = log real sales price	(1)	(2)	(3)	(4)	(5)
HOA_ever		0.0656***	0.100***	0.0356	0.123***
		(0.00142)	(0.00223)	(0.0218)	(0.00213)
HOA_trendpost			-0.00373***		-0.00332***
			(0.000158)		(0.000162)
HOA_trendpost_5yrs				0.0498**	
				(0.0219)	
HOA_trendpost_5to15yrs				0.0459**	
				(0.0219)	
HOA_trendpost_15+yrs				-0.0295	
				(0.0219)	
HOA_ever*HOA_size					-7.01e-05***
					(2.90e-06)
Total Sq. Feet of Lot (1000s)	.00113***	.00118***	.00119***	.00119***	.00120***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Improved quality	0.00777***	0.00772***	0.00778***	0.00776***	0.00773***
	(0.000494)	(0.000493)	(0.000492)	(0.000492)	(0.000492)
Year Built	0.00391***	0.00355***	0.00338***	0.00339***	0.00332***
	(6.02e-05)	(6.09e-05)	(6.18e-05)	(6.16e-05)	(6.17e-05)
Total Living Area (1000s sq. ft.)	.3494***	.3485***	.3485***	.3484***	.3483***
	(.00172)	(.00172)	(.00172)	(.00172)	(.00172)
# Buildings	-0.0338***	-0.0341***	-0.0343***	-0.0343***	-0.0344***
	(0.00150)	(0.00149)	(0.00149)	(0.00149)	(0.00149)
Vacant	-1.111***	-1.110***	-1.111***	-1.110***	-1.110***
	(0.00404)	(0.00403)	(0.00403)	(0.00404)	(0.00403)
Single-Family	0.155***	0.158***	0.156***	0.156***	0.158***
	(0.00344)	(0.00345)	(0.00344)	(0.00344)	(0.00345)
Intercept	3.693***	4.413***	4.738***	4.724***	4.863***
	(0.126)	(0.127)	(0.129)	(0.129)	(0.129)
Juris F.E.?	Y	Y	Y	Y	Y
County*yr dummies?	Y	Y	Y	Y	Y
N	596,791	596,791	596,791	596,791	596,791
R-squared	0.689	0.690	0.690	0.690	0.690

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1 percent levels, respectively.

Table 4: Baseline regression results, Unincorporated County Areas

Dep. Var. = log real sales price	(1)	(2)	(3)	(4)	(5)
HOA_ever		0.0703***	0.110***	0.0347	0.120***
		(0.00111)	(0.00165)	(0.0227)	(0.00168)
HOA_trendpost			-0.00404***		-0.00238***
			(0.000121)		(0.000116)
HOA_trendpost_5yrs				0.0675***	
				(0.0227)	
HOA_trendpost_5to15yrs				0.0395*	
				(0.0227)	
HOA_trendpost_15+yrs				-0.0190	
				(0.0228)	
HOA_ever*HOA_size					-7.98e-05***
					(1.82e-06)
Total Sq. Feet (1000s)	-0.00007***	-0.00006***	-0.00006***	-0.00006***	-0.00006***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Improved quality	0.000908*	0.000785	0.00106**	0.00103**	0.00173***
	(0.000492)	(0.000492)	(0.000491)	(0.000491)	(0.000488)
Year Built	0.00322***	0.00284***	0.00254***	0.00256***	0.00263***
	(6.13e-05)	(6.12e-05)	(6.28e-05)	(6.24e-05)	(6.27e-05)
Total Living Area (1000s sq. ft.)	.3253***	.3238***	.3243***	.3242***	.3249***
	(.00211)	(.00211)	(.00211)	(.00211)	(.00212)
# Buildings	-0.0573***	-0.0551***	-0.0555***	-0.0555***	-0.0547***
	(0.00124)	(0.00124)	(0.00124)	(0.00124)	(0.00124)
Vacant	-1.158***	-1.156***	-1.154***	-1.155***	-1.151***
	(0.00287)	(0.00286)	(0.00286)	(0.00286)	(0.00286)
Single-Family	0.177***	0.193***	0.189***	0.189***	0.190***
	(0.00230)	(0.00235)	(0.00235)	(0.00235)	(0.00235)
Intercept	4.562***	5.278***	5.871***	5.845***	5.705***
	(0.151)	(0.150)	(0.151)	(0.151)	(0.151)
County F.E.?	Y	Y	Y	Y	Y
Year dummies?	Y	Y	Y	Y	Y
N	1,017,184	1,017,184	1,017,184	1,017,184	1,017,184
R-squared	0.607	0.608	0.608	0.608	0.609

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1 percent levels, respectively.

Table 5: Interaction regression results, Land Use Regime, Incorporated Jurisdictions

Dep. Var. = log real sales price	(1)	(2)	(3)	(4)
HOA_ever	0.100***	0.100***	0.0919***	0.106***
	(0.00223)	(0.00268)	(0.00269)	(0.00266)
HOA_trendpost	-0.00373***	-0.00353***	-0.00355***	-0.00351***
	(0.000158)	(0.000158)	(0.000158)	(0.000158)
HOA_ever*LandUseCount		-0.00107***		
		(0.000290)		
HOA_ever*Inflexible			0.00129***	
			(0.000455)	
HOA_ever*Flexible				-0.00782***
				(0.000923)
Total Sq. Feet (1000s)	.00119***	.00084***	.00084***	.00084***
	(0.00010)	(0.00009)	(0.00009)	(0.00009)
Improved quality	0.00778***	0.00689***	0.00688***	0.00689***
	(0.000492)	(0.000491)	(0.000491)	(0.000491)
Year Built	0.00338***	0.00328***	0.00327***	0.00329***
	(6.18e-05)	(6.01e-05)	(6.01e-05)	(6.01e-05)
Total Living Area (1000s sq. ft.)	.3485***	.3680***	.3680***	.3680***
	(.00172)	(.00157)	(.00157)	(.00157)
# Buildings	-0.0343***	-0.0366***	-0.0366***	-0.0367***
	(0.00149)	(0.00152)	(0.00152)	(0.00152)
Vacant	-1.111***	-1.121***	-1.121***	-1.121***
	(0.00403)	(0.00413)	(0.00413)	(0.00413)
Single-Family	0.156***	0.147***	0.147***	0.148***
	(0.00344)	(0.00346)	(0.00346)	(0.00346)
Intercept	4.736***	5.002***	5.030***	4.993***
	(0.129)	(0.126)	(0.126)	(0.126)
Juris F.E.?	Y	Y	Y	Y
County*yr dummies?	Y	Y	Y	Y
N	596,791	579,392	579,392	579,392
R-squared	0.690	0.696	0.696	0.696

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1 percent levels, respectively.

Table 6: Interaction Regression Results, Fiscal Regime, Incorporated Jurisdictions

Dep. Var. = log real sales price	(1)	(2)	(3)	(4)	(5)
HOA_ever	0.100***	0.0958***	0.101***	0.0849***	0.128***
	(0.00223)	(0.00347)	(0.00419)	(0.00370)	(0.00330)
HOA_trendpost	-0.00373***	-0.00362***	-0.00360***	-0.00357***	-0.00344***
	(0.000158)	(0.000157)	(0.000159)	(0.000161)	(0.000161)
HOA_ever*PT per cap		0.00263			
		(0.00661)			
HOA_ever*share PT			-0.0172		
			(0.0179)		
HOA_ever*Expend per cap				0.00516***	
				(0.00100)	
HOA_ever*share serv expend					-0.133***
					(0.0129)
Total Sq. Feet (1000s)	.00119***	0.00087***	0.00087***	0.00087***	0.00087***
	(0.00010)	(0.00009)	(0.00009)	(0.00009)	(0.00009)
Improved quality	0.00778***	0.00701***	0.00701***	0.00703***	0.00705***
	(0.000492)	(0.000492)	(0.000492)	(0.000492)	(0.000492)
Year Built	0.00338***	0.00329***	0.00329***	0.00328***	0.00327***
	(6.18e-05)	(5.97e-05)	(5.97e-05)	(5.97e-05)	(5.97e-05)
Total Living Area (1000s sq. ft.)	.3485***	.3671***	.3672***	.3671***	.3673***
	(.00172)	(.00155)	(.00155)	(.00155)	(.00155)
# Buildings	-0.0343***	-0.0362***	-0.0362***	-0.0362***	-0.0363***
	(0.00149)	(0.00152)	(0.00152)	(0.00152)	(0.00152)
Vacant	-1.111***	-1.125***	-1.125***	-1.125***	-1.124***
	(0.00403)	(0.00409)	(0.00409)	(0.00409)	(0.00409)
Single-Family	0.156***	0.147***	0.147***	0.147***	0.146***
	(0.00344)	(0.00346)	(0.00346)	(0.00346)	(0.00346)
Intercept	4.738***	4.535***	4.574***	4.561***	4.610***
	(0.129)	(0.124)	(0.124)	(0.124)	(0.124)
Juris F.E.?	Y	Y	Y	Y	Y
County*yr dummies?	Y	Y	Y	Y	Y
N	596,791	588,584	588,584	588,584	588,584
R-squared	0.690	0.697	0.697	0.697	0.697

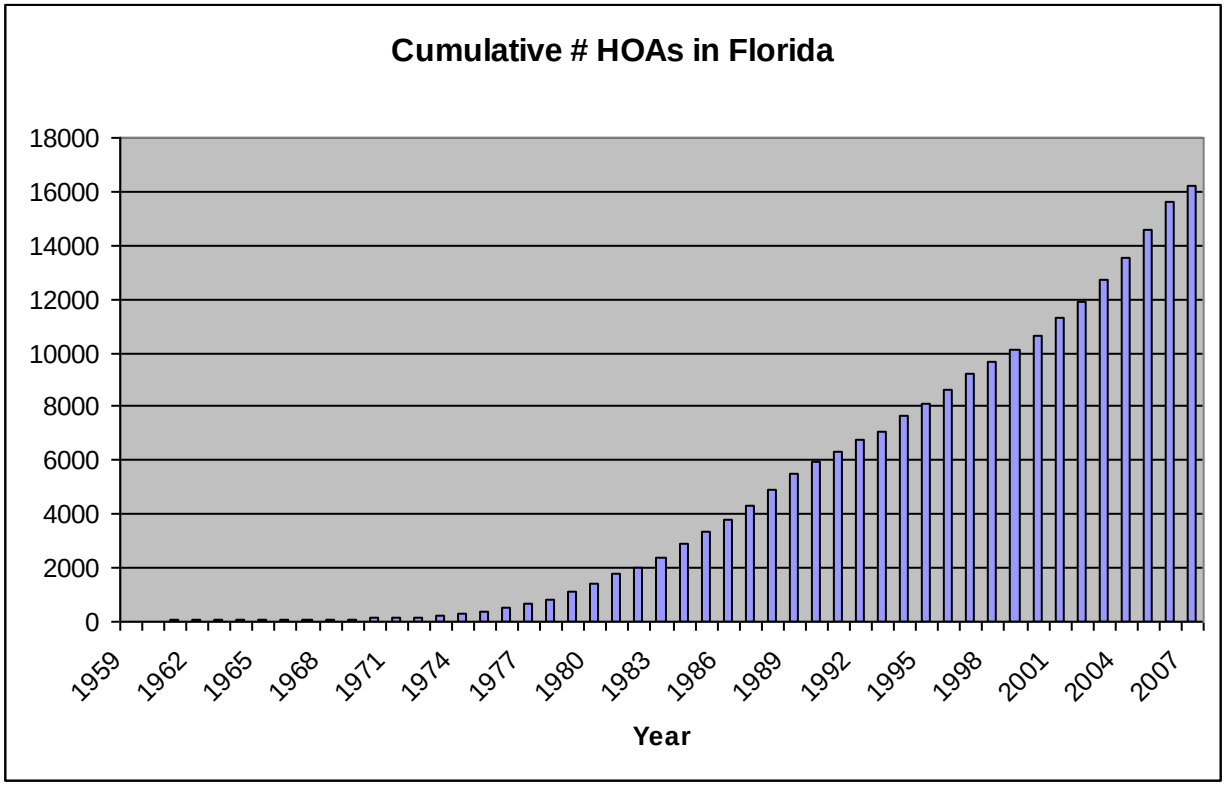
Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1 percent levels, respectively.

Table 7: Spillover Regressions, Incorporated Jurisdictions

Dep. Var. = log real sales price	(1)	(2)	(3)	(4)	(5)
HOA_ever	0.100***	0.121***	0.120***	0.122***	0.121***
	(0.00223)	(0.00231)	(0.00230)	(0.00231)	(0.00231)
HOA_trendpost	-0.00373***	-0.00389***	-0.00390***	-0.00391***	-0.00391***
	(0.000158)	(0.000159)	(0.000159)	(0.000159)	(0.000159)
Parcel_spill		0.0499***	0.0593***	0.0412***	0.0578***
		(0.00138)	(0.00154)	(0.00169)	(0.00155)
Parcel_spill*HOA_size			-5.12e-05***		-7.95e-05***
			(4.93e-06)		(8.67e-06)
Parcel_spill*nHOA				0.00582***	
				(0.000698)	
Parcel_spill*HOA_size*nHOA					2.71e-05***
					(6.59e-06)
Total Sq. Feet (1000s)	.00119***	.00119***	.00119***	.00119***	.00119***
	(0.00010)	(0.00010)	(0.00010)	(0.00010)	(0.00010)
Improved quality	0.00778***	0.00767***	0.00766***	0.00766***	0.00767***
	(0.000492)	(0.000491)	(0.000491)	(0.000491)	(0.000491)
Year Built	0.00338***	0.00329***	0.00330***	0.00327***	0.00329***
	(6.18e-05)	(6.16e-05)	(6.16e-05)	(6.17e-05)	(6.17e-05)
Total Living Area (1000s sq. ft.)	.3485***	.3480***	.3479***	.3479***	.3479***
	(.00172)	(.00171)	(.00171)	(.00171)	(.00171)
# Buildings	-0.0343***	-0.0344***	-0.0343***	-0.0345***	-0.0343***
	(0.00149)	(0.00149)	(0.00149)	(0.00149)	(0.00149)
Vacant	-1.111***	-1.109***	-1.109***	-1.108***	-1.109***
	(0.00403)	(0.00403)	(0.00403)	(0.00403)	(0.00403)
Single-Family	0.156***	0.156***	0.156***	0.156***	0.156***
	(0.00344)	(0.00341)	(0.00341)	(0.00341)	(0.00341)
Intercept	4.737***	4.927***	4.896***	4.962***	4.910***
	(0.129)	(0.129)	(0.128)	(0.129)	(0.129)
Juris F.E.?	Y	Y	Y	Y	Y
County*yr dummies?	Y	Y	Y	Y	Y
N	596,791	596,791	596,791	596,791	596,791
R-squared	0.690	0.691	0.691	0.691	0.691

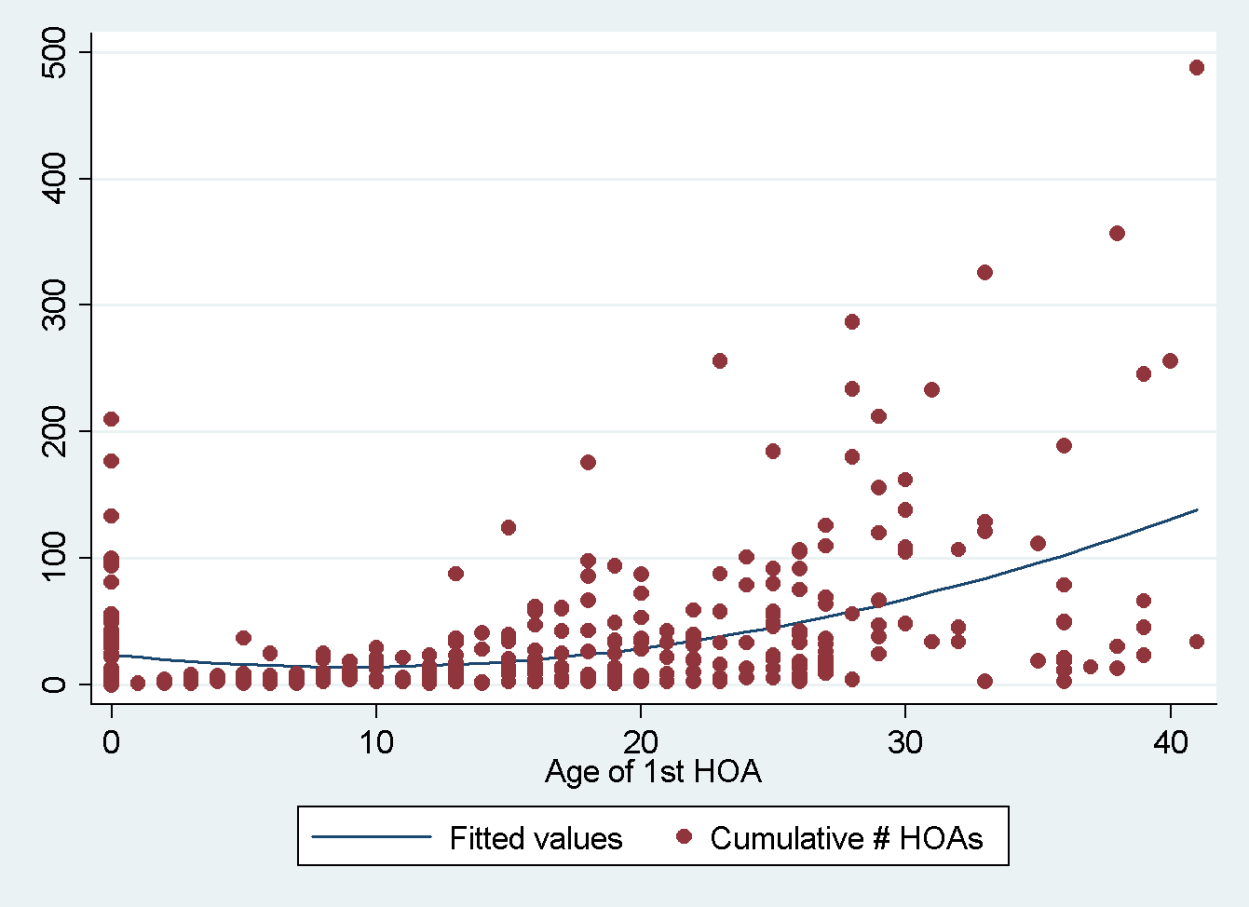
Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1 percent levels, respectively.

Chart 1: Number of HOAs in Florida Over Time



Source: Meltzer (2009)

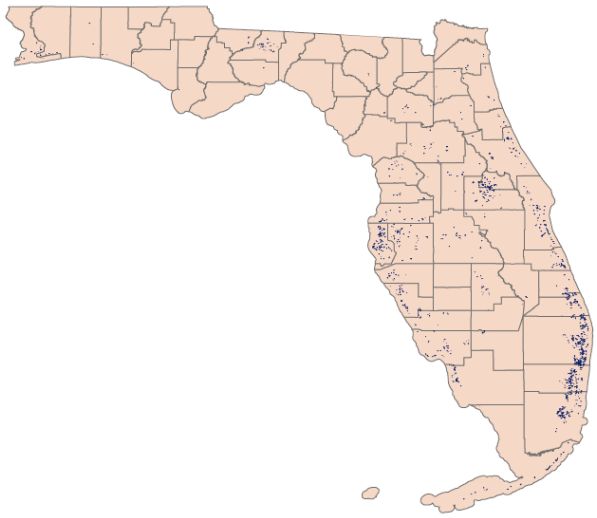
Chart 2: The Persistence and Frequency of HOAs



Notes: Fitted values are estimated in the presence of year and region fixed effects.
Source: Meltzer (2009)

Figure 1: Spread of HOAs Across Florida

1970



2000