Evidence on the Distributional Effects and Administrative Feasibility of a Land Value Tax: Who Wins, Who Loses, and Can It Happen?

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Abstract

This study examines how replacing a uniform property tax with a land value tax would shift the tax burden. The study uses parcel-level property data for Tarrant County over the 10-year period 1997 through 2006. Tarrant County is an urban county located in the northeast part of Texas. The county covers approximately 864-square miles and currently has about 1.7 million residents.

The study first examines the general effects of a land value tax on the tax burden across and within the different property classes. It then focuses on the vertical and horizontal equity effects of a LVT on owner-occupied single-family residential properties. This study also surveys the chief appraisers in Texas in order to assess their current level of awareness of land value and split-rate taxation and obtain their opinions on the administrative feasibility of a land value tax system.

About the Author

Elizabeth Plummer is an Associate Professor of Accounting at the Neeley School of Business, Texas Christian University, in Fort Worth, Texas. Her current research focuses on property and land value taxation issues, as well as the recent changes made to the financial reporting requirements of state and local governments. She has published several papers which focus on the distributional effects of the property tax and the land value tax. She currently teaches federal income tax courses in the graduate and undergraduate programs in the Neeley School. Prior to entering academics, she worked in the tax department at Price Waterhouse (now PricewaterhouseCoopers).

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Evidence on the Distributional Effects and Administrative Feasibility of a Land Value Tax: Who Wins, Who Loses, and Can It Happen?

1. Introduction

This study has two primary objectives: (1) to examine how replacing a uniform property tax with a land value tax would shift the tax burden across properties, with the primary focus on shifts across residential properties and households, and (2) to survey appraisal district officials in order to assess their level of awareness of land value and split rate taxation, and gather information on their opinions regarding the administrative feasibility of a land value or split rate tax system.

This study makes several important contributions to the study of land value taxation (LVT). Most importantly, this study's results provide detailed empirical evidence on the vertical and horizontal equity effects of LVT. Most empirical studies that examine LVT focus on the LVT's economic efficiencies (e.g., reduction in deadweight losses) or its effects on economic development (e.g., reduction in urban sprawl). Comparatively, there are few studies that provide detailed evidence on how a LVT would shift the tax burden across property owners.[1] The lack of evidence seems especially pronounced if one considers the sentiment that the "public cares deeply about equity and less about efficiency" (Schwartz 1998, 260). Understanding the LVT's equity effects is essential if the LVT is ever to be considered a serious alternative, or supplement, to the traditional property tax. Academicians, policymakers, and taxpayers need empirical evidence on the LVT's distributional effects to help facilitate informed policy decisions. This study's results help provide that evidence.

This study also provides evidence on the degree to which appraisal district officials are aware of LVT and their opinions regarding a LVT's administrative feasibility, especially with respect to land valuation issues. Adopting a land value or split rate tax system would constitute dramatic change. Effecting such change would require that local officials be aware of LVT, understand its benefits, and have confidence that it could be effectively administered (Brunori 2003). This study surveys the individuals responsible for administering the local property tax (i.e., the chief appraiser of each appraisal district in Texas) to measure their awareness of LVT and gather information on their opinions regarding the administrative feasibility of a land value or split rate tax system.

All empirical analysis in this paper uses parcel-level property data for Tarrant County for the 10-year period 1997 through 2006. Tarrant County is an urban county located in the northeast part of Texas. The county covers approximately 864-square miles, contains 34 different cities and 16 different school districts, and currently has about 1.7 million residents. Most of those residents live in Fort Worth, the county's largest city. Tarrant County's population grew by 24% over the period 1990 to 2000, and it was ranked as the 7th fastest growing county in the U.S in 2004.

[1] Grote (2009)'s annotated bibliography on LVT studies shows that there is a relatively small number of studies that focus on the LVT's equity implications. Some of these include De Cesare et al. (2003), Bowman and Bell (2008), Haveman (2004), and England and Zhao (2005). See Plummer (2009) for a discussion of the fairness and distributional issues related to a LVT system.

All analysis in this paper also assumes that the current uniform property tax would be replaced by a revenue-neutral LVT. The tax rate for a revenue-neutral LVT reflects the tax rate on land values that would be required to generate tax revenue that is equal to the combined property tax revenues of the three primary taxing jurisdictions (county, school district, and city). Over the period 1997 through 2006, the combined property tax rate for the Tarrant County area averaged about 2.42%—ranging from a low of 2.34% in 1998 to a high of 2.50% in 2004. For this same 10-year period, the revenue-neutral land value tax rate would average about 10.3%—ranging from a low of 8.94% in 1997 to a high of 11.4% in 2005. (Appendix A provides a detailed discussion of the computation of the revenue-neutral land value tax rate for each year.)

This study has several sections, and the major results from each section are summarized below.

Effects of a LVT on the Tax Burden across and within Property Classes

Section 3 examines how a revenue-neutral LVT would shift the tax burden across property classes. In sum, the relative property class values for 1997 through 2006 suggest that:

- The aggregate tax burden would *increase* for vacant lots and tracts, commercial properties, utilities, and residential inventory;
- The aggregate tax burden would *decrease* for single-family residential properties, multi-family residential properties and mobile homes; and
- The aggregate tax burden would be approximately the same for industrial properties.

Examining the 2006 property class values suggests that the amount of tax shifting between property classes would be significant. Specifically:

- The aggregate tax liability for single-family residential properties would decrease by 22.1%, and the aggregate tax liability for multi-family residential properties would decrease by 39.2%. The aggregate tax liability for industrial properties would decrease slightly (4.9%). Mobile homes have no land value and would generate no LVT liability.
- The aggregate tax burden for commercial properties would increase by 33.7%. It would almost double for utilities (86.6% increase), and it would more than double for residential inventory (167.8% increase). Vacant lots and tracts would experience a 355% increase in their tax burden.

When I examine the change in tax liability *within* property classes for 2006, the evidence suggests that:

- Taxes would be lower for 85% of single-family residential properties under a LVT system (median decrease of 30.4%), and for 86% of multi-family residential properties (median decrease of 41.9%).
- The tax liability for all vacant lot properties would increase by 355.3%. All mobile home owners would benefit from a LVT and would pay nothing.
- The majority of commercial property owners (69.7%) would face a tax increase, and the average increase would be relatively large. The mean increase would be 88.4%, and the

median increase would be 56.3%.

- Taxes would increase for only 44% of industrial property owners. However, there is significant variation among industrial property owners. The median percentage change is negative for industrial properties (-10.7%), but the mean percentage change is positive (19.2%).
- Nearly all utilities (95.1%) and residential inventory properties (91.9%) would face higher taxes under a LVT system, and the median percentage change is 355.4% for owners within both property classes.

Owner-Occupied Single-Family Residential Properties

Section 4 examines in detail how a revenue-neutral LVT would shift the tax distribution among owner-occupied single-family residential properties. I examine the effects of a LVT on both vertical and horizontal equity. Vertical equity generally requires that persons with a greater ability to pay (e.g., more income) should pay more tax than persons with a lesser ability to pay. Horizontal equity requires that taxpayers with the same ability to pay (e.g., same income level) should pay the same amount of tax. In sum, this study's results suggest that:

- For all years, the median tax liability is less under a LVT than under the property tax. The median decrease is 23.0% in 1997, while the median decrease would be about 31.0% in years 2002 through 2006.
- Not all single-family property owners would experience a tax decrease if a LVT replaced the property tax. Taxes would increase for 20.5% of property owners in 1997. This percentage is generally decreasing over time, and only 12.7% of owners would face a higher tax burden in 2006 under a LVT.

Vertical Equity: To provide evidence on the vertical equity effects of changing from a property tax to a LVT, I rank all single-family properties from high value to low value, and then divide them into three groups—top 30%, middle 40%, and bottom 30%.

- The evidence suggests that, on average, all three groups would experience a tax decrease if a LVT replaced the current property tax. For the years 1997 through 2002, the highest-valued properties would experience the largest percentage decrease in tax liability, while the lowest-valued properties would experience the smallest percentage decrease. For example, in 1997, the median percentage change is -13.9% for the lowest-valued properties, while it is -28.8% for the highest-valued properties. The median percentage change for the middle 40% of properties is -21.6%. In the years from 2003 to 2006, however, the median percentage change in tax liability is comparable across groups—ranging from -31% to -33% in all cases.
- For all years, owners of the lowest-valued properties would be the most likely to face a tax increase. In 1997, almost 36% of these property owners would experience a tax increase under a LVT, but the percentage drops to 17% in 2002 and remains there (or slightly lower) in all subsequent years. For the highest-valued properties across all years, about 12% to 13% would pay higher taxes under a LVT. Owners of the middle 40% of properties are the least likely to face a tax increase if a LVT were implemented. In each

year subsequent to 1999, fewer than 10% of these property owners would face a tax increase under a LVT system.
- I also compute a Suits index for each year to measure the effects of a LVT on vertical equity. Results suggest that that the revenue-neutral LVT would be slightly more progressive than the property tax, at least for the years 2000 through 2006.

Horizontal Equity: To examine the effects of a LVT system on horizontal equity, I compare the variation in the LVT effective tax rates across property owners of equal incomes.

- Evidence suggest that the very lowest-valued properties (i.e., those groups with properties valued at less than $40,000) have the greatest variation in effective tax rates under a LVT. This suggests that horizontal equity would be lower for the lowest-valued properties.

Survey of Chief Appraisers

Section 6 presents results for the survey sent to the chief appraiser of each of the 254 appraisal districts in the state of Texas. I received a total of 132 usable surveys, for a 52.0% response rate. The first section of the survey asked the administrators about their familiarity with LVT and split-rate taxation. The second section contained seven statements designed to elicit the chief appraisers' opinions on the administrative feasibility of a LVT system. Overall, the survey results can be summarized as follows:

- Slightly more than 8% of appraisers (n=11) said that they were *very familiar* with LVT, while 19.8% (n=26) said they were *somewhat familiar* with LVT. The remaining 71.8% (n=94) said they were *not familiar at all* with LVT. The pattern of results is similar for appraisers' familiarity with split-rate taxation, although even fewer appraisers expressed familiarity with split-rate taxation.
- Appraisers who indicated they were *familiar* (very or somewhat) with either land value or split-rate taxation are employed by larger appraisal districts than appraisers who said they were *not familiar at all* with either form of taxation.
- On average, appraisers do not agree with statements that:
    - It would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property;
    - The current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings;
    - Relative to the current property tax system, property owners would prefer a system that taxed land at a higher rate than buildings; or
    - A system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system.
- Relative to the other statements, more appraisers responded *agree* or *strongly agree* to statements suggesting that the current assessed values for land would be good estimates of land market value if the state switched to a LVT or split-rate tax system.

- There is some evidence to suggest that appraisers from larger districts are more likely to agree (less likely to disagree) with the statements that, "*For business property (for single-family residential property)*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings." This could indicate that appraisers from larger districts have more confidence that they are currently assessing land at its market value—perhaps because of better-trained staff or more sophisticated assessment techniques.

The remainder of this study is organized as follows. Section 2 discusses the data and provides descriptive statistics for Tarrant Appraisal District for the years 1997 through 2006. Section 3 discusses the effects of a LVT on the tax burden across and within major property classes. Section 4 and Section 5 provide detailed analysis of the LVT's distributional effects for owner-occupied single-family residential properties. Section 6 presents the survey results. The final section provides implications for future research.

2. Data and Sample

2.1 Tarrant Appraisal District Database

Tarrant Appraisal District's boundaries are approximately the same as those of Tarrant County. Tarrant County is an urban county located in the northeast part of Texas. The county covers approximately 864-square miles, contains 34 different cities and 16 different school districts, and currently has about 1.7 million residents. Most of those residents live in Fort Worth, the county's largest city. Tarrant County's population grew by 24% over the period 1990 to 2000, and it was ranked as the 7th fastest growing county in the U.S in 2004.

Data for this study is obtained from the Tarrant Appraisal District (TAD) database for the years 1997 through 2006. I also use data from the 2000 U.S. Census for the analysis in Section 5. The TAD data contains parcel-level information for all real properties in TAD, including residential, business, agricultural, and vacant land. Each year's data is on a separate CD and is contained in a Microsoft Access database. Data items include property identifiers, name of the property owner and the owner's address, separate market values for land and improvements, land size, information on structure (e.g., size, year built, number of rooms, etc.), and exemption codes. In addition, each year also contains a separate SALES file, which includes all sales of real property that occurred in TAD during the year.[2] This file includes property identifiers, the sales date, the seller's name, the buyer's name, and the sales price. This SALES file also includes an indicator variable that denotes a "Vacant Lot Sale."

2.2 Using Appraised Market Values as Proxies for Market Values

Real property market values are generally unobservable, unless a property is sold during the year. Therefore, this study uses appraisal value to proxy for unobservable market value. Although not a perfect proxy, there are several reasons why TAD's land values are likely to be

[2] The file does not contain sales that TAD acquired under the protection of non-disclosure agreements.

reasonable estimates of market values—especially for residential properties.[3] First, Texas law requires that real property be appraised at 100% of market value and that appraisal records report separate market values for land and improvements (*Texas Property Tax Code,* Section 25.02, 2006). In addition, TAD's Residential Appraisal Department reappraises real property annually. This means that a property's appraised market value, including its specific land and improvement components, are reviewed and adjusted each year.

Second, TAD's primary approach to valuing residential properties is the market or sales comparison approach. The district uses recent sales within a neighborhood to determine the appropriate market adjustment for the neighborhood. This generally involves comparing the recent sales prices of neighborhood properties to their appraised values to determine the appropriateness of the sold properties' appraised values (i.e., sales ratio analysis). TAD maintains a file that contains sales data for vacant and improved residential real properties. This information is collected from a variety of comprehensive sources, including: Board of Realtor's MLS and other sales vendors, builders, realtors and brokers, district survey letters sent to buyers and sellers, field discovery, and protest hearings. In 2005 and 2006, the number of sales received and processed by the residential research staff was 24,756 and 25,856, respectively.

Third, the district's Residential Department conducts residential land analysis to develop land-specific values. The appraisers use sales data where available, or abstraction and allocation methods, to help ensure that the land values best reflect the land's contribution to overall property value. The managers develop a base lot value or primary rate for each residential parcel. Specific land influences are used to adjust parcels outside the neighborhood norm for such factors as view, shape, size, and topography. Vacant land is valued using comparable sales. In summary, these reasons support using TAD's appraised values as reasonable estimates of the land values that would occur under a LVT system. This is likely to be especially true in the early years of a LVT as appraisal districts would be transitioning from their current property tax systems with existing land values.

Texas state law requires tax appraisals to be equal, uniform, and at market value. Similar to many states, state education aid in Texas is based in part on a school district's taxable value per student. Accordingly, the Texas Property Tax Code requires the State Comptroller to conduct an annual *Property Value Study*, which estimates the taxable property value in each school district and measures county appraisal district performance. This helps ensure that school districts are not under-assessing property values in an attempt to increase state funds.

The Comptroller's annual study provides several measures of appraisal level and uniformity. Level refers to whether typical properties are appraised at 100% of the legally required level, while uniformity refers to whether properties are appraised uniformly within a category or from one category to another. Table 2.0 provides level and uniformity measures for all properties combined and separately for single-family residential properties. The *median appraisal ratio* measures how closely an appraisal district's typical appraisal is to market value. A median of 1.0 suggests that the sample properties are appraised at 100% of market value. *Coefficient of dispersion* (COD) is used to measure appraisal uniformity and is a measure of horizontal equity.

[3] The following information is taken from the TAD Reappraisal Plan (2006) and confirmed from discussions with TAD officials.

The COD measures whether appraisal districts are appraising properties at an equal percentage of market value. It does this by measuring how closely the individual sample ratios are clustered around the median ratio. A smaller COD value suggests greater uniformity. The *price-related differential* (PRD) is a measure of vertical equity, and is used to indicate whether assessment ratios of high-value and low-value properties are systematically different. In its *Standard on Ratio Studies* (2007), the International Association of Assessing Officers (IAAO) suggests that acceptable standards are a median appraisal level between 0.9 and 1.10; a COD value of between 5.0 to 10.0 for single-family residential properties (slightly higher for other property types); and a PRD of between 0.98 and 1.03.

Table 2.0 shows that all median ratios for TAD properties range from 0.96 and 1.01. The COD value never exceeds 7.99 for all properties, while it never exceeds 6.76 for single-family residential properties. Lastly, the PRD values range from 0.99 to 1.04 for all properties, and range from 1.00 to 1.01 for single-family residential properties. The values in Table 2.0 suggest that the Tarrant Appraisal District results are well within the IAAO guidelines.

2.3 Descriptive Statistics: Tarrant Appraisal District from 1997 through 2006

Table 2.1 uses information from the TAD database to provide descriptive information on the (assessed) market value of real properties over the period 1997 through 2006.[4] The information pertains to all real property parcels in Tarrant County, but excludes tax-exempt properties and agricultural properties. Table 2.1 shows that the number of real properties grew by 27.6% over the 10-year period, while total market value grew by 128%–from $41.1 billion to $93.7 billion. The growth in real estate values greatly exceeded the 10-year growth in the Consumer Price Index (CPI) for the Dallas-Fort Worth area, which was only 25.6%.

Table 2.1 shows that land values grew more slowly than improvement values, with 10-year growth rates of 88% and 142%, respectively. Accordingly, land represents a lower percentage of overall total market value in 2006 than in earlier years. The last three columns of Table 2.1 are computed using parcel-level property data and present the mean, median, and coefficient of variation for the land-value ratio. "Land-value ratio" is defined as the proportion of a property's total market value attributable to land value (i.e., the market value of land, divided by the market value of land plus improvements). Table 2.1 shows that the mean average land-value ratio declined from 34.75% in 1997 to 28.32% in 2006, and the median land-value ratio declined from 22.35% to 16.33%. The last column shows the coefficient of variation (CV) for the land-value ratios. The CV is a unitless measure of relative variation and is defined as the ratio of the standard deviation to the mean, expressed as a percentage. A larger CV means that there is more variability in land-value ratios across properties. Table 2.1 shows that CV has increased by 24.1% over the 10-year period. Overall, Table 2.1 suggests that, on average, land-value ratios have decreased over the past ten years, but there is more variation across properties.

Table 2.2 presents the number of parcels for each property class from 1997 through 2006. Single-family residential properties make up the largest proportion of real properties. For example, there were 448,146 single-family properties in 2006, which represents about 77% of

[4] As discussed in Section 2.2, I use TAD assessed values to proxy for market values. For ease of exposition, I refer to all values simply as market values.

the total 578,574 real properties. "Vacant lots and tracts" is the property class with the next largest number of properties (42,718 parcels in 2006), followed by "residential inventory" (34,330 properties in 2006). The number of vacant lots and tracts has decreased over the 10-year period, while the number of residential inventory properties has more than doubled. This most likely reflects the large housing boom occurring during this time. There are significantly more commercial properties than industrial properties (e.g., 23,765 versus 861), and the number of commercial properties has grown faster (16.9% versus 8.4%). The number of utilities properties has remained fairly steady (about 1,700 properties) over the entire 10-year period.

Table 2.3 presents the total market value for each property class over the 10-year period, while Table 2.4 presents the percentage of total market value represented by each property class. In 2006, the total market value of all properties was approximately $93.7 billion, with $61.2 billion (65.4%) composed of single-family residential properties. Although the market value of single-family properties has more than doubled since 1997 (Table 2.3), each year this property class approximates 65% of total market value for all properties combined (Table 2.4). Commercial property is the next largest property class in value terms, with a total market value in 2006 of $20.4 billion—or about 21.8% of the total market value for all properties combined. The other property classes each represent a much smaller percentage of total market value. Over the 10-year period, Table 2.4 shows that multi-family residential properties represented about 7.4% of total property value, vacant lots and tracts represented an average of 2.3%, and industrial properties represented about 1.7%. The other property classes each represented about 1% or less of total market value. It is worth noting that there is little fluctuation across years in the percentages in Table 2.4. Absent property tax exemptions and limitations, the property tax burden across property classes would have changed little, if any, across the years 1997 through 2006.

3. Effects of a Land Value Tax on the Tax Burden across and within Property Classes

Table 3.1 presents the percentage of land value represented by each property class. Single-family residential land value represents the largest percentage of total land value—representing 54.6% in 1997, 50.9% in 2006, and averaging 51.2% over the 10-year period. Commercial land value constitutes the next largest percentage—representing 26.9% of total land value in 1997, 29.1% in 2006, and an average of 29.6% over the 10-year period. The land value for vacant lots and tracts represents 9.7% of total land value, on average. The percentage of total land value represented by multi-family residential properties has varied little across the 10 years, averaging 4.6% each year. The percentage of land value represented by residential inventory has grown, from 1.5% in 1997 to 4.8% in 2006.

By comparing Table 3.1 with Table 2.4, one can gain a sense of how shifting from a property tax system to a LVT system would shift the tax burden across property classes. For single-family residential properties, land value represents an average of 51.2% total land value (Table 3.1), while property value represents an average of 64.7% of total market value (Table 2.4). This indicates that, on an aggregate basis, a LVT system would shift the burden *away* from single-family residential properties and on to other property classes. Of course, there would be some single-family properties that would experience a larger tax burden under a LVT system,

but the single-family property class as a whole would pay less tax liability.

A similar comparison can be made for the other property classes. As one would expect, vacant lots and tracts would face an *increased* tax burden if the property tax were replaced by a revenue-neutral LVT. The aggregate tax burden would also *increase* for commercial properties, utilities, and residential inventory. Conversely, the aggregate tax burden would *decrease* for multi-family residential properties and mobile homes. The total tax burden for industrial properties would be approximately the same under a LVT system.

All analysis in this paper assumes that the current uniform property tax would be replaced by a revenue-neutral LVT. The tax rate for a revenue-neutral LVT reflects the tax rate on land values that would be required to generate tax revenue that is equal to the combined property tax revenues of the three primary taxing jurisdictions (county, school district, and city). Appendix A describes in detail how I determine the revenue-neutral LVT for each year. Table A-1 shows that, over the period 1997 through 2006, the combined property tax rate averaged 2.4245%—ranging from a low of 2.3351% in 1998 to a high of 2.4977% in 2004. For this same 10-year period, the revenue-neutral land value tax rate would average 10.3069%—ranging from a low of 8.9398% in 1997 to a high of 11.4026% in 2005.

To better understand the magnitude of the changes in the tax burden across property classes, Table 3.2 presents information on the property tax and LVT liabilities for each property class for 2006. The first two columns of Table 3.2 show the dollar amounts paid by each property class under the current property tax system and under a revenue-neutral LVT system. The next two columns present the percentage distribution of the tax burdens, and the last column presents the percentage change in tax liability if the property tax were replaced with a revenue-neutral LVT. The aggregate tax liability for single-family residential properties would decrease by 22.1%, while the aggregate tax liability for multi-family residential properties would decrease by 39.2%. The aggregate tax burden for industrial properties would decrease slightly (decrease of 4.9%). Mobile homes have no land value, and would therefore pay nothing under a LVT (decrease of 100%).

Table 3.2 shows that vacant lots and tracts would experience a 355% increase in the tax burden. This magnitude is expected since the LV tax rate is 355% higher than the property tax rate (2.3833% compared with 10.8534%; see Table A-1). The market value for vacant lots is composed solely of land value, so the full market value is subject to the higher tax rate. The aggregate tax burden for commercial properties would increase by 33.7%, while it would almost double for utilities (increase of 86.6%). The aggregate tax burden for residential inventory property would more than double, with an increase of 167.8%.

Table 3.2 provides information about how the *aggregate* tax burden of property classes would change, but the table does not provide any information about how the tax burden would change for individual properties. Therefore, Table 3.3 presents descriptive statistics on the percentage change in tax liability for individual properties within each property class for 2006. For each individual property in each class, I calculated the tax liability under both the current property tax and the revenue-neutral LVT, and then calculated the percentage change in tax liability for each property. Specifically, the change in a property's value is equal to: property tax liability minus

LVT liability, divided by property tax liability. The first two columns of Table 3.3 present the mean and median percentage change for each property class. The next two columns present the 10% and 90% deciles. The 10% decile corresponds to the value such that 10% of the data values lie at or below this value (and 90% lie above). The 90% decile value corresponds to the value such that 90% of the data values lie at or below this value (and 10% lie above). The fifth column shows the percentage of properties in the property class that would experience a tax increase if the LVT replaced the property tax. The last column presents the coefficient of variation (CV), which measures the variability across properties in the percentage change in tax liability.

Table 3.3 shows that only 14.9% of single-family residential properties would face a tax increase if the LVT replaced the property tax. 85% of single-family properties would pay lower taxes under a LVT, and the mean (median) decrease would be 21.5% (30.4%). Clearly, most single-family residential property owners would pay lower taxes under a LVT system. Similarly, only 14.0% of multi-family residential properties would face a tax increase if a LVT replaced the property tax. Taxes would decrease for the remaining 86% of multi-family residential property owners, with an average decrease of 31.3% (mean) and 41.9% (median). As expected, the tax liability for all owners of vacant lots would more than quadruple (increasing 355.3%). All mobile home owners would benefit from a LVT and would pay nothing.

The majority of commercial property owners (69.7%) would face a tax increase if a LVT replaced the property tax, and the average increase would be relatively large. The mean increase would be 88.4%, and the median increase would be 56.3%. In contrast, taxes would increase for only 44% of industrial property owners if a LVT were implemented. However, there is significant variation among industrial property owners. Although the median percentage change is negative for industrial properties (-10.7%), the mean percentage change is a positive 19.2%. This indicates that the LVT would be less than the property tax for 56% of industrial properties. However, for some taxpayers, a LVT would increase their tax liability significantly. This variation across industrial property owners is also evidenced by the large CV value (471.1), which is the largest of all property classes.

Lastly, Table 3.3 shows that nearly all utilities (95.1%) and residential inventory properties (91.9%) would face higher taxes under a LVT system, and the increase would be significant. Taxes would increase a mean average of 321.3% for utilities and 292.4% for residential inventory. The median percentage change is 355.4% for both property classes.

In sum, the relative property class values for 1997 through 2006 suggest that:

- The aggregate tax burden would *increase* for vacant lots and tracts, commercial properties, utilities, and residential inventory;
- The aggregate tax burden would *decrease* for single-family residential properties, multi-family residential properties and mobile homes; and
- The aggregate tax burden would be approximately the same for industrial properties.

Examining the 2006 property class values suggests that the amount of tax shifting between property classes would be significant. Specifically:

- The aggregate tax liability for single-family residential properties would decrease by 22.1%, and aggregate tax liability for multi-family residential properties would decrease by 39.2%. The aggregate tax liability for industrial properties would decrease slightly (4.9%). Mobile homes have no land value and would generate no LVT liability.
- The aggregate tax burden for commercial properties would increase by 33.7%. It would almost double for utilities (86.6% increase), and it would more than double for residential inventory (167.8% increase). Vacant lots and tracts would experience a 355% increase in their tax burden.

When I examine the change in tax liability *within* property classes for 2006, the evidence suggests that:

- Taxes would be lower for 85% of single-family residential properties under a LVT system (median decrease of 30.4%).
- Taxes would be lower for 86% of multi-family residential properties (median decrease of 41.9%).
- The tax liability for all vacant lot properties would increase by 355.3%. All mobile home owners would benefit from a LVT and would pay nothing.
- The majority of commercial property owners (69.7%) would face a tax increase, and the average increase would be relatively large. The mean increase would be 88.4%, and the median increase would be 56.3%.
- Taxes would increase for only 44% of industrial property owners. However, there is significant variation among industrial property owners. The median percentage change is negative for industrial properties (-10.7%), but the mean percentage change is positive (19.2%).
- Nearly all utilities (95.1%) and residential inventory properties (91.9%) would face higher taxes under a LVT system, and the median percentage change is 355.4% for owners within both property classes.

4. Owner-Occupied Single-Family Residential Properties

4.1 Descriptive Statistics

Section 4 examines how replacing the property tax with a revenue-neutral LVT would shift the tax burden for owner-occupied, single-family residential properties. The section first discusses descriptive information for these properties over the period 1997 through 2006. The section then presents evidence on how a LVT would change the tax liabilities for these homeowners, and how a LVT would affect both vertical equity and horizontal equity.

Table 4.1 presents descriptive information on the market value of owner-occupied single-family residential properties in Tarrant County over the period 1997 through 2006. Table 4.1 shows that the number of owner-occupied single-family properties grew by 32.5% over the 10-year period, while total market value grew by 129.8%–from $21.4 billion to $49.1 billion. The growth in real estate values greatly exceeded the 10-year growth in the Consumer Price Index (CPI) for the Dallas-Fort Worth area, which was only 25.6%.

Table 4.1 shows that land values grew more slowly than improvement values, with 10-year growth rates of 75.6% and 145%, respectively. Accordingly, land represents a lower percentage of overall total market value in 2006 than in earlier years. The last three columns of Table 4.1 are computed using parcel-level property data and present the mean, median, and coefficient of variation for the land-value ratio. As before, "land-value ratio" is defined as the proportion of a property's total market value attributable to land value (i.e., the market value of land, divided by the market value of land plus improvements). Table 4.1 shows that the mean average land-value ratio declined from 22.5% in 1997 to 16.6% in 2006, and the median land-value ratio declined from 20.5% to 15.2%. The last column shows the coefficient of variation (CV) for the land-value ratios. A larger CV means that there is more variability in land-value ratios across properties. Table 4.1 shows that CV has remained fairly steady over the 10-year period. Overall, Table 4.1 suggests that, on average, land-value ratios for owner-occupied single-family residential properties have decreased over the past ten years, and the variability across properties has remained relatively constant.

4.2 Change in Tax Liability of Switching from a Property Tax to a Land Value Tax

Table 4.2 presents descriptive statistics on the average property tax and LVT liabilities for owner-occupied single family residential properties over the period 1997 through 2006. The first four columns show the average (mean and median) dollar amounts paid each year under the current property tax system and a revenue-neutral LVT system. The next four columns show the mean and median change in tax liability and percentage change in tax liability, while the last column shows the percentage of properties with an increase in tax liability if a LVT were implemented. For ease of exposition and interpretation, the information in Table 4.2 is graphically depicted in the figures below.

Figure 4.1 below shows the median tax liability for all owner-occupied single-family residential properties for the years 1997 through 2006. For all years, the median tax liability is less under a LVT than under the property tax. For example, in 1997, the median LV tax liability is $1,341, and the median property tax liability is $1,676. In 2006, the median LV tax liability is $1,954, while the median property tax liability is $2,920.

Figure 4.1:

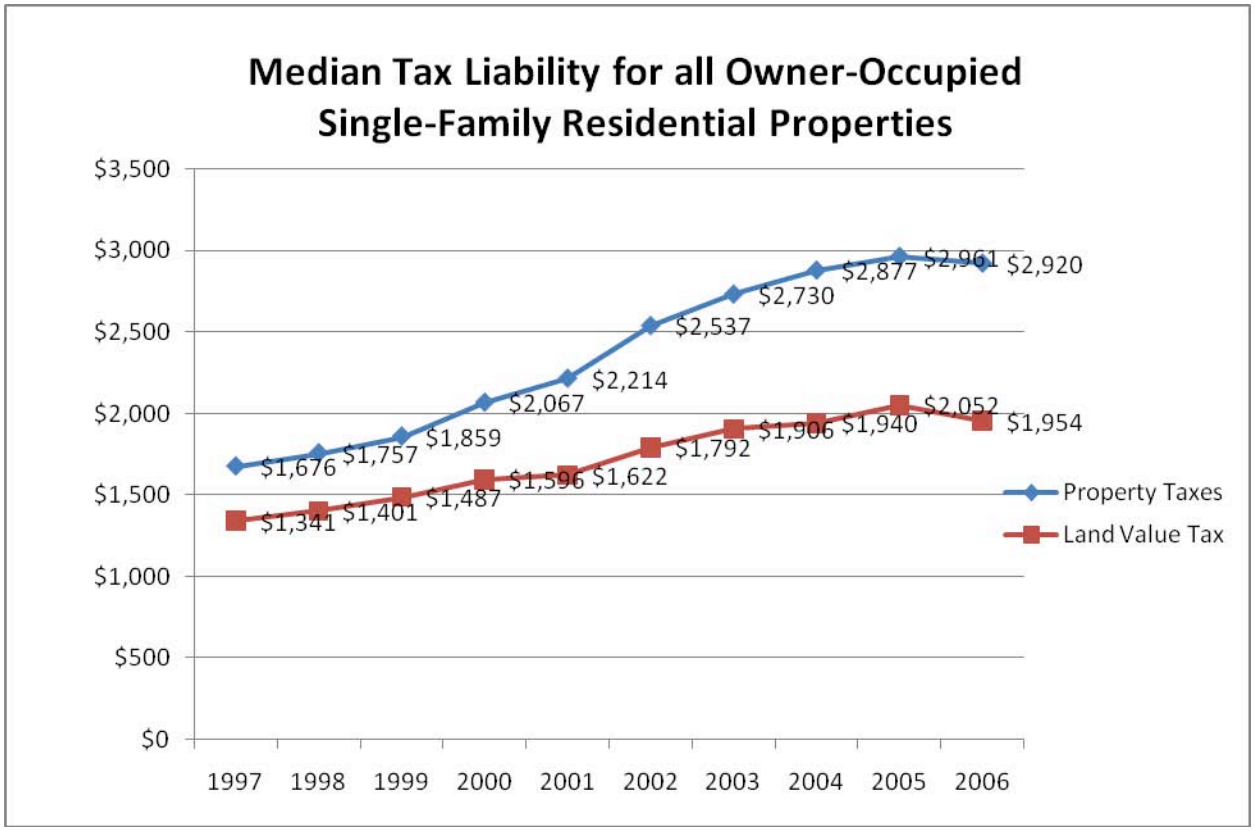


Figure 4.2 below shows the median change in tax liability for single-family properties if a LVT replaced the property tax. In each year, a LVT would decrease the median tax liability paid by these properties, and the decrease becomes larger over time. In 2006, the median decrease in tax liability is $841.

Figure 4.2:

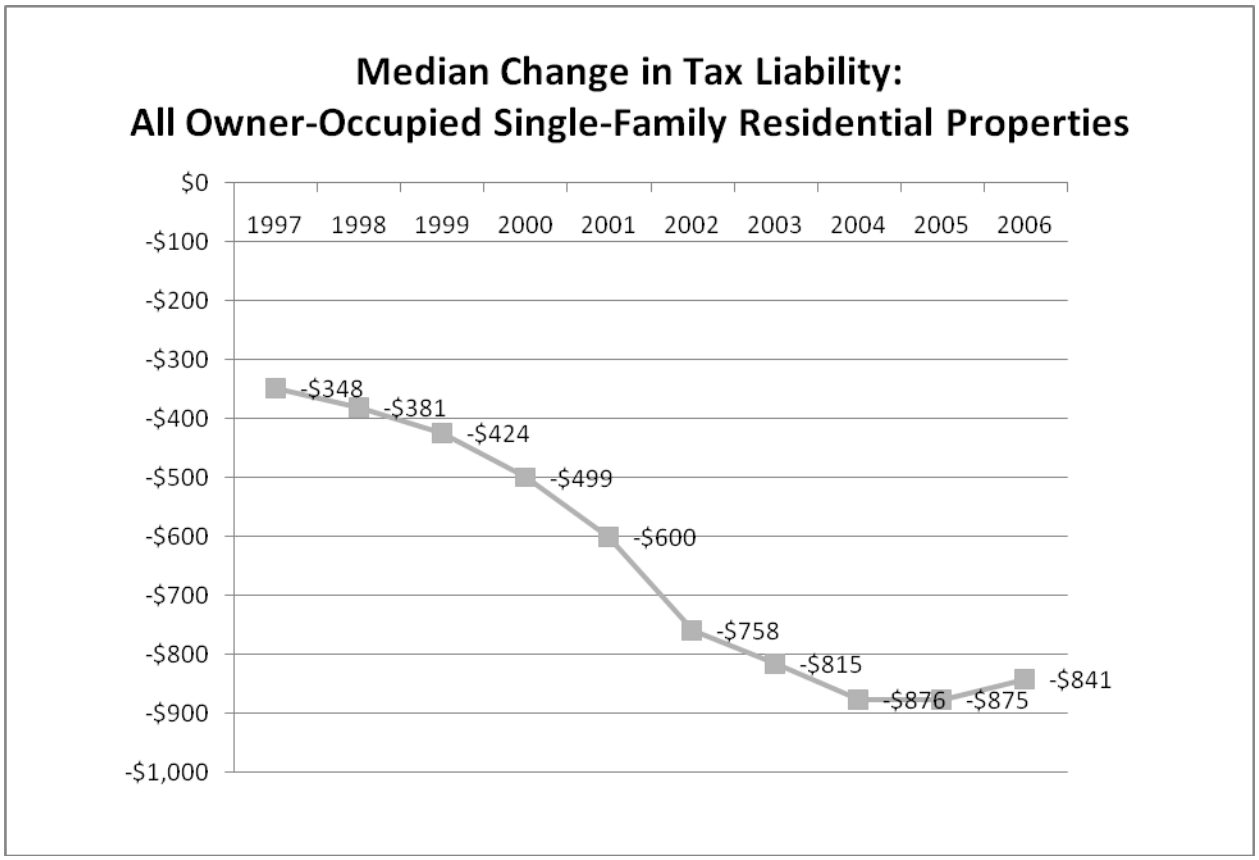
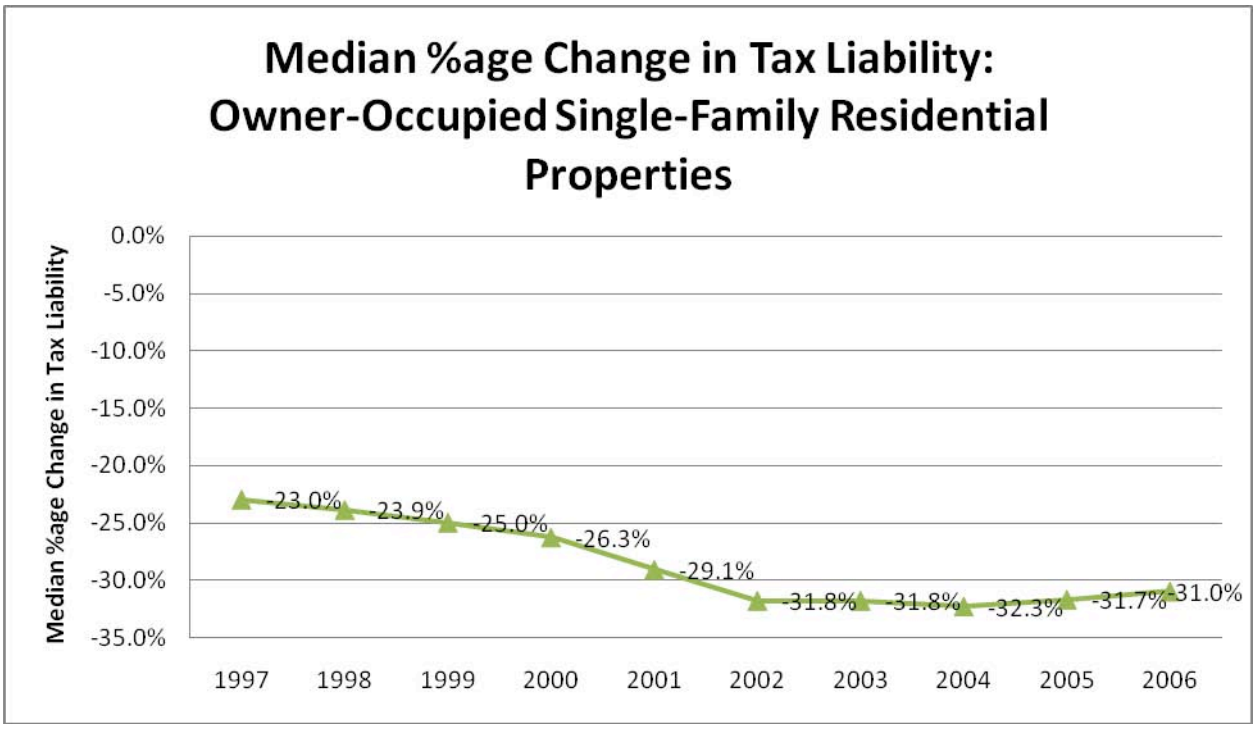


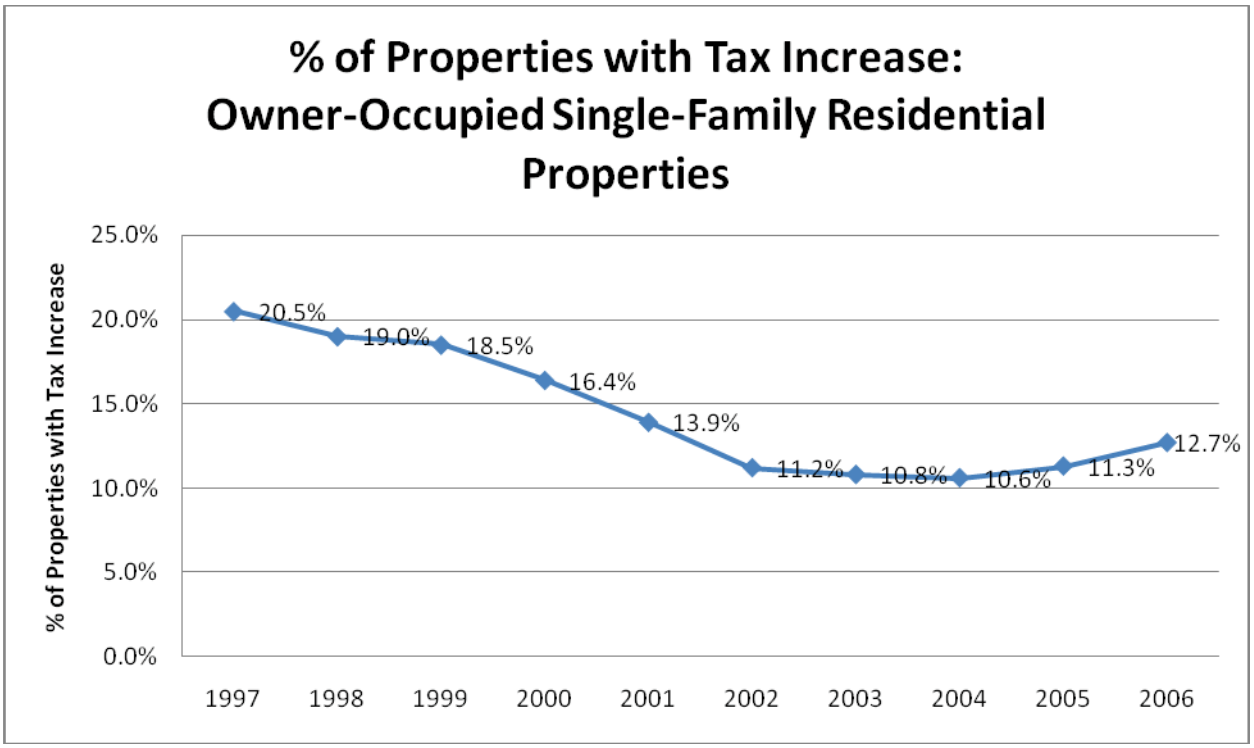
Figure 4.3 expresses the median change in tax liability as a percentage of the property's current property tax liability. This helps control for changes in the dollar's value over time. Figure 4.3 shows that moving to a LVT would decrease the tax liability for owner-occupied single-family properties by a median of about 23% in 1997, while the median decrease would be about 31% in years 2002 through 2006.

Figure 4.3:



Not all single-family residential property owners would experience a tax decrease if a LVT replaced the property tax. Figure 4.4 below shows the percentage of property owners that would experience a tax *increase* if a LVT were implemented. The figure shows that a revenue-neutral LVT would increase taxes for 20.5% of single-family property owners in 1997. This percentage is generally decreasing over time, and only 12.7% of single-family property owners would face a higher tax burden in 2006 if a LVT were implemented.

Figure 4.4:



4.3 Effects of a LVT on Vertical Equity

4.3.1 Changing from a Property Tax to Land Value Tax System, by property wealth group

To provide evidence on the vertical equity effects of changing from a property tax to a LVT, England and Zhao (2005) and Bowman and Bell (2008) rank all single-family properties from high value to low value, and then divide them into three groups—top 30%, middle 40%, and bottom 30%. For each group, they report statistics on the mean change in tax liability and on the percentage of property owners that would face a tax increase if a LVT were implemented. I perform a similar analysis for my sample for the years 1997 through 2006. Results are presented in Table 4.3 and in Figures 4.5 and 4.6 below. I discuss only the figures in the text. Table 4.3 provides additional detail, including both mean and median values, as well as descriptive statistics for the dollar change in tax liability and the average property value for each group.

Figure 4.5 shows that the all three groups, on average, would experience a tax decrease if a LVT replaced the current property tax. For the years 1997 through 2002, the highest-valued 30% of properties would experience the largest percentage decrease in tax liability, while the lowest-valued 30% of properties would experience the smallest percentage decrease. For example, in 1997, the median percentage change is -13.9% for the lowest-valued properties, while it is -28.8% for the highest-valued properties. The median percentage change for the middle 40% of properties is -21.6%. This suggests that the highest-valued properties would experience the largest decrease in taxes from moving to a LVT. In the years from 2003 to 2006, however, the median percentage change in tax liability is comparable across groups—ranging from -31% to -33% in all cases.

Figure 4.5:

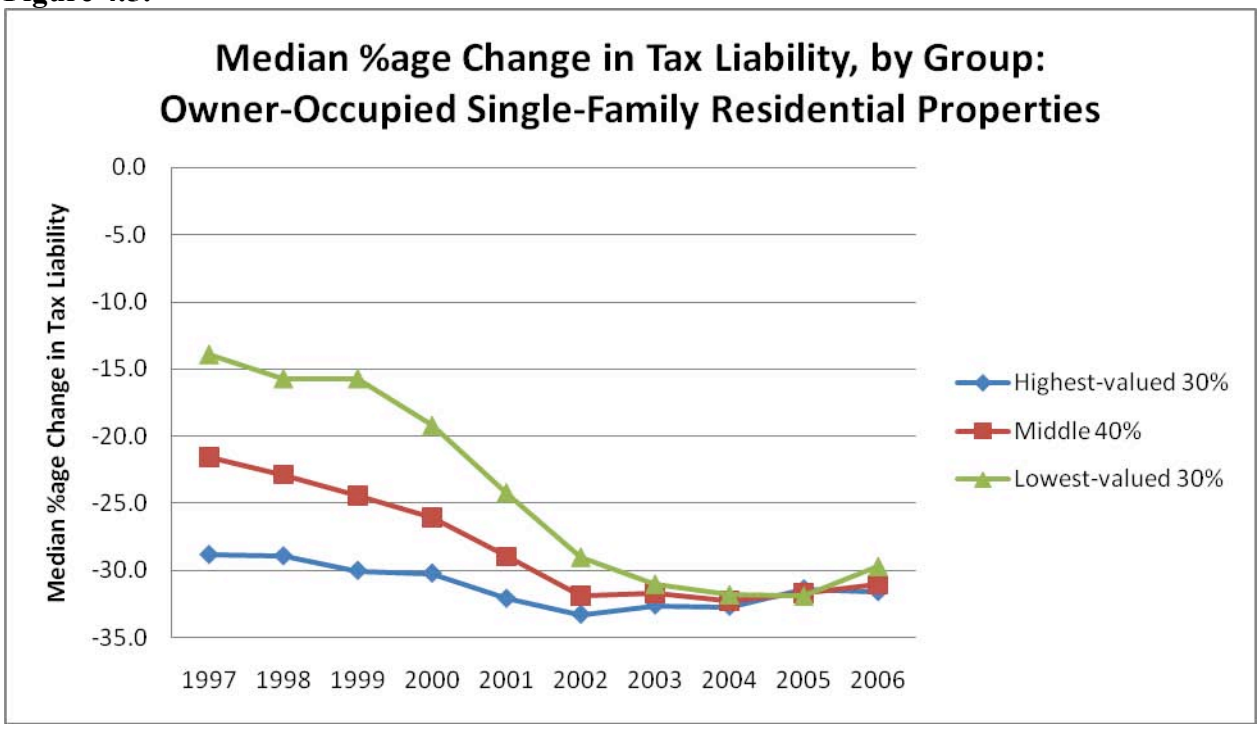


Figure 4.6 below shows the percentage of property owners in each group that would experience a tax *increase* if a LVT were implemented. For all years, owners of the lowest-valued properties would be the most likely to face a tax increase. However, the percentage of this group facing an increase drops significantly over this period. In 1997, almost 36% of property owners in the lowest-value group would experience a tax increase under a LVT, but the percentage drops to 17% in 2002 and remains there (or slightly lower) in all subsequent years. For the highest-valued properties, there is little change across time in the percentage of owners who would experience a tax increase. For all years, about 12% to 13% would pay higher taxes under a LVT. Owners of the middle 40% of properties are the least likely to face a tax increase if a LVT were implemented. In all years except 1997, the percentage of property owners who would pay higher taxes under a LVT is the smallest for this group, and in each year subsequent to 1999, fewer than 10% of these property owners would face a tax increase.

Figure 4.6:

In sum, the evidence for owner-occupied single-family residential properties over the period 1997 through 2006 suggests that:

- For all years, the median tax liability is less under a LVT than under the property tax. The median decrease is 23.0% in 1997, while the median decrease would be about 31.0% in years 2002 through 2006.
- Not all single-family property owners would experience a tax decrease if a LVT replaced the property tax. Taxes would increase for 20.5% of property owners in 1997. This percentage is generally decreasing over time, and only 12.7% of owners would face a higher tax burden in 2006 under a LVT.
- When properties are divided into three groups (high-value, middle-value, and low-value), the evidence suggests that all groups, on average, would experience a tax decrease if a LVT replaced the current property tax. For the years 1997 through 2002, the highest-valued properties would experience the largest percentage decrease in tax liability, while the lowest-valued properties would experience the smallest percentage decrease. For example, in 1997, the median percentage change is -13.9% for the lowest-valued properties, while it is -28.8% for the highest-valued properties. The median percentage change for the middle 40% of properties is -21.6%. In the years from 2003 to 2006, however, the median percentage change in tax liability is comparable across groups—ranging from -31% to -33% in all cases.
- For all years, owners of the lowest-valued properties would be the most likely to face a tax increase. In 1997, almost 36% of these property owners would experience a tax increase under a LVT, but the percentage drops to 17% in 2002 and remains there (or slightly lower) in all subsequent years. For the highest-valued properties across all years, about 12% to 13% would pay higher taxes under a LVT. Owners of the middle 40% of properties are the least likely to face a tax increase if a LVT were implemented. In each year subsequent to 1999, fewer than 10% of these property owners would face a tax increase under a LVT system.

4.3.2 Suits Indices for a LVT System

The evidence above is useful in providing insight into how the tax burden would change under a LVT. The evidence is also useful because direct comparisons can be made with England and Zhao (2005) and Bowman and Bell (2008). However, it does not provide a summary measure of the LVT system's overall vertical equity. Researchers examining property tax incidence often use the Suits index to measure a tax system's overall progressivity (Suits 1977). Therefore, in this section, I compute the Suits index for the LVT for each year 1997 through 2006. The Suits index (S) is constructed from a graph of the cumulative tax burden (y axis) against cumulative income (x axis):

$$S = 1 - \frac{\sum_{k=1}^{10} \frac{1}{2}\left(LVT_k + LVT_{k-1}\right)\left(Y_k - Y_{k-1}\right)}{5{,}000} \qquad (1)$$

where

LVT_k = cumulative percent of land value tax burden for population deciles 1 through k, and

Y_k = cumulative percent of total income for population deciles 1 through k.

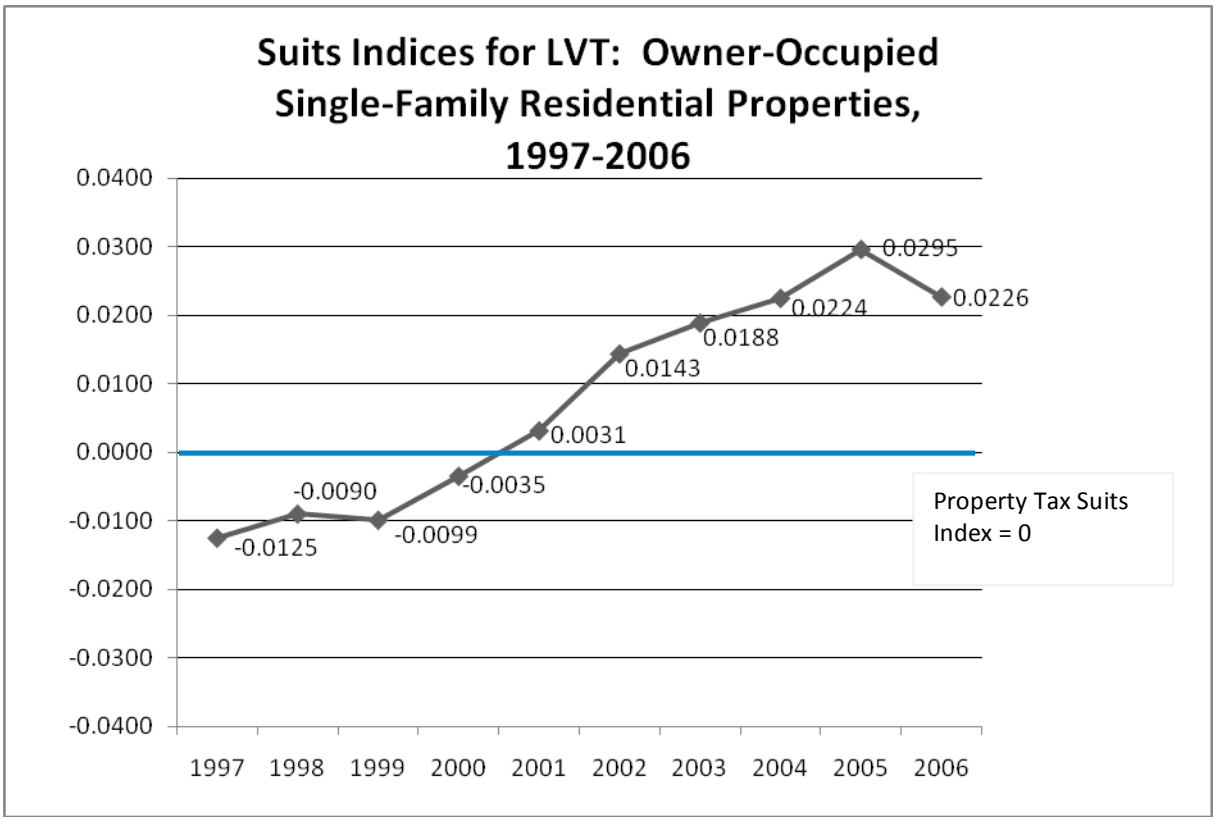
The Suits index can vary from -1 to +1, with -1 indicating maximum regressivity and +1 indicating maximum progressivity. An index value of 0 indicates a proportional tax.

Measuring household income: The first step in calculating S is to rank the sample households according to income. Lifetime income measures are preferable to annual income measures because lifetime measures are less subject to temporary fluctuations (Metcalf 1994, p. 65-66), and because individuals are likely to make consumption decisions based on lifetime income and not annual income (Fullerton and Metcalf 2002). Consistent with prior research (Poterba 1989, 1991; CBO 1990; Metcalf 1994), I use consumption as a proxy for lifetime income, and use residential property value to measure consumption. To calculate S, I rank properties according to residential property value, divide them into deciles, and use cumulative property value as the measure of Y in equation (1) above. Because I use property value as the measure of taxpayer income, the Suits index for a uniform property tax system without exemptions is zero (i.e., a perfectly proportional tax).[5]

I compute a Suits index for the LVT system separately for each year and report results in Table 4.4 and Figure 4.7 below. The index is slightly negative (S=-0.0125) in 1997, and then steadily increases to 0.0226 in 2006. The trend of values suggests that the LVT becomes slightly more progressive over the 10-year period. However, all index values are very close to zero, with values ranging from -0.0125 to 0.0295. Overall, the values suggest that the revenue-neutral LVT would be slightly more progressive than the property tax in years subsequent to 1999.

[5] Perfect proportionality results because taxpayers are being taxed at a uniform rate on the full market value of their property, which is also the measure of their income. The property tax would not be perfectly proportional if exemptions were allowed to reduce a property's taxable value below its market value. (See Plummer 2003.)

Figure 4.7:



4.4 Effects of a LVT on Horizontal Equity

Horizontal equity suggests that taxpayers with equal before-tax incomes should have the same effective tax rates (Gravelle and Gravelle 2006). However, under a LVT, property owners with identical total property values will owe different tax liabilities if their land values differ. For example, consider the following scenario involving three property owners:

Property Owner	Land Value	Building Value	Total Property Value	*Land Intensity*	Tax liability: 1.5% prop. tax	Tax liability: 2.6% LVT	*Change in tax liability*
A	$ 500	$1,500	$2,000	*0.250*	$30	$13	*57% Decrease*
B	1,150	850	2,000	*0.575*	30	30	*No Change*
C	1,800	200	2,000	*0.900*	30	47	*57% Increase*
	$3,450	$2,550	$6,000	*Avg: 0.575*	$90	$90	

Each owner has total property valued at $2,000, and each owner's tax liability is $30. If the property tax is replaced with a revenue-neutral LVT, the required LVT rate would be 2.6%, and total tax collections would remain at $90. However, because of differences in land value ratios across properties, a LVT changes the distribution of tax liabilities. Owner A's land value ratio is

below the average ratio of 0.575—meaning that his tax liability will decrease, while Owner C's ratio is above the average—meaning that his tax liability will increase. Owner B's land intensity ratio is exactly equal to the average, so his tax liability does not change. If one considers these property owners as equals because of their equivalent *total* property value ($2,000 each), then the LVT system reduces horizontal equity.

To examine the effects of a LVT system on horizontal equity, I compare the variation in the LVT effective tax rates across property owners of equal incomes. Consistent with the Suits index calculations, I use residential property value as a proxy for household income. For each of the ten years separately, I divide taxpayers into 45 groups based on their similarity in property value, and all members of a group are considered income equivalents.[6] I compute the effective tax rate for each property, defined as the property's tax liability under the LVT system divided by the property's total market value. I then compute the coefficient of variation (CV) for the effective tax rates separately for each of the 45 groups of income-equivalent property owners.[7] Accordingly, there are 45 coefficients of variation computed for each of the 10 years.

I analyze horizontal equity separately for each year, but for parsimony, only present results for 2006.[8] Table 4.5 presents descriptive statistics for each group's effective tax rate (ETR) under a LVT for 2006. The first three columns of Table 4.5 provide information on the 45 separate groups, including the number of properties in each group and the range of property values represented by each group. The last four columns of Table 4.5 provide information on the effective tax rates for each group, including the median value, the CV, and the 5% and 95% quantiles. For ease of discussion, Figure 4.8 below plots the ETR's coefficient of variation for each group.

Higher CV values indicate greater variation in ETR's for the group, and thus less horizontal equity. Figure 4.8 shows that the lowest-valued properties (i.e., those groups with properties valued at less than $40,000) have the greatest variation in ETR's. The CV values are 91, 88, and 74. The CV for all other groups is 58 or less. Groups with properties valued between $80,000 and $160,000 have the lowest CV values (ranging from 34 to 39), consistent with greater horizontal equity. The CV values for properties valued at greater than $160,000 tend to increase as property values increase, but all CV values fall between 40 and 58. Results for other years

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[6] Properties are divided into groups as follows. For properties with values between $10,000 and $200,000, groups are formed by $10,000 increments (i.e., all properties with values between $10,000 and $20,000 are Group 1, all properties with values between $20,000 and $30,000 are Group 2, etc.). Properties with values between $200,000 and $500,000 are formed into groups by $25,000 increments; properties with values between $500,000 and $1,000,000 are formed into groups by $50,000 increments; and properties with values between $1,000,000 and $2,000,000 are formed into groups by $250,000 increments. I delete properties with values below $10,000 and above $2,000,000. This deletes fewer than 2,000 properties in any year. For 2006, this deletes 350 properties.

[7] The CV is a widely-used measure of horizontal equity and measures the relative dispersion in effective tax rates among members within a single group. It can be expressed as:

$$CV_N = SD_N / Avg(T_N) \times 100$$

CV_N = coefficient of variation of effective tax rates for group N;
SD_N = standard deviation of effective tax rates for group N; and
T_N = mean effective tax rate for group N.

[8] Results for all other years are available from the author upon request.

(1997 through 2005) exhibit a similar pattern, with the very lowest-valued properties exhibiting the greatest variation in ETR's. This suggests that, under a LVT system, horizontal equity would be lower for the lowest-valued properties.

Figure 4.8:

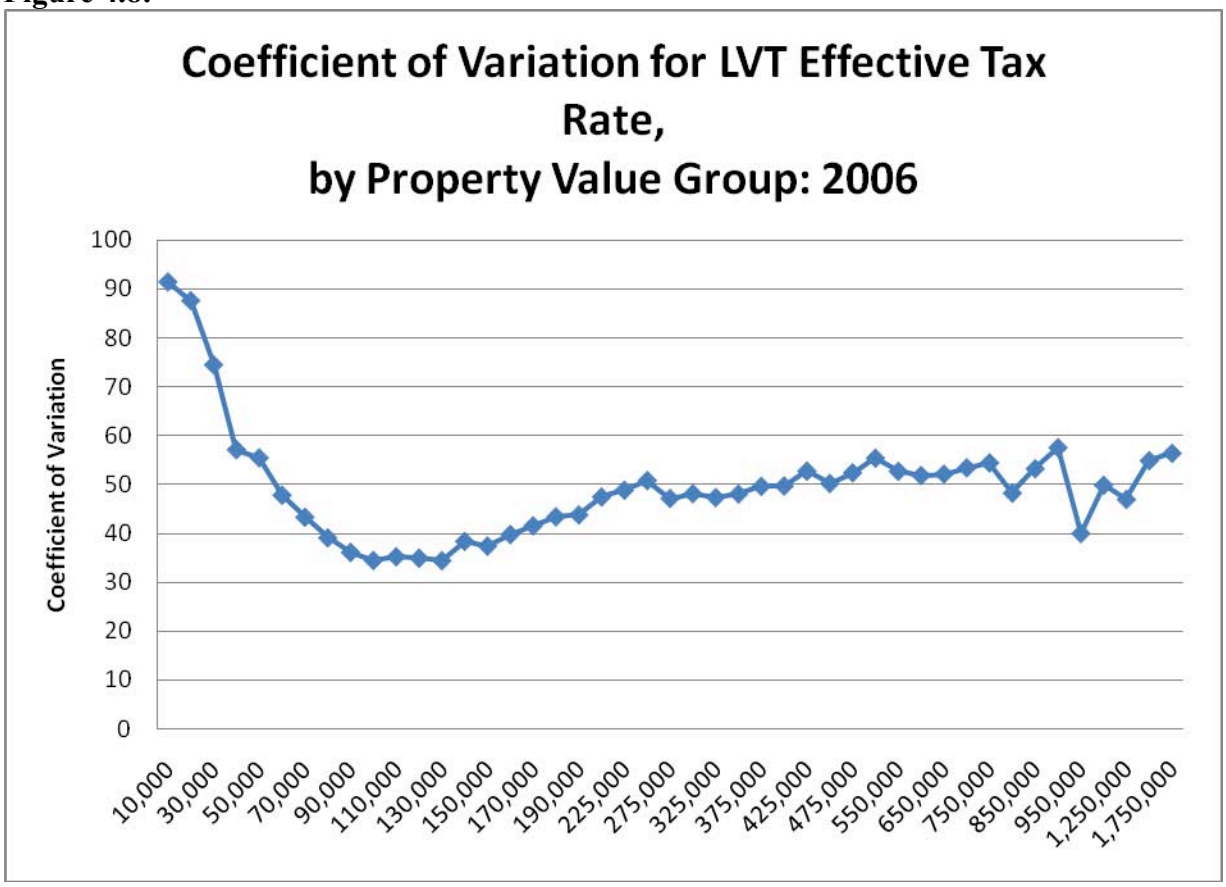
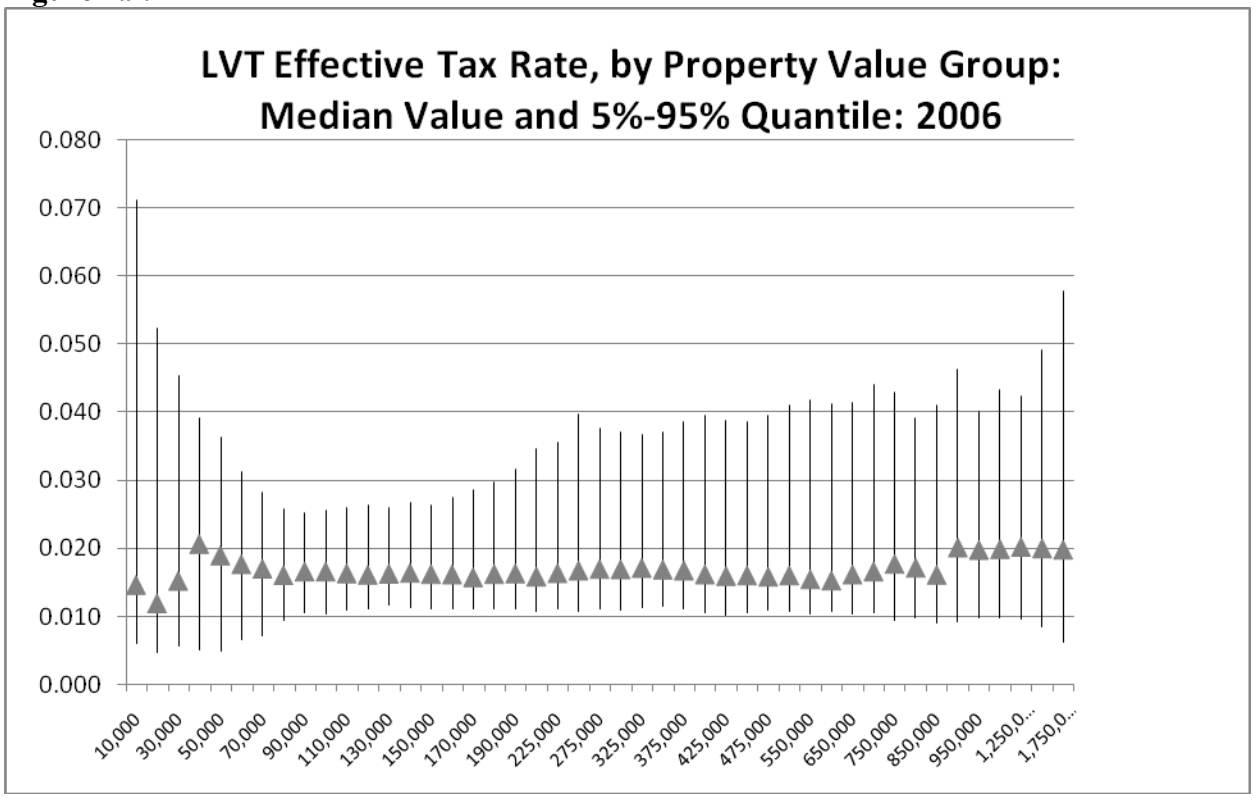


Figure 4.9 below plots the median ETR for each of the 45 groups for 2006, and also presents a line depicting the range from the 5% to the 95% quantile. For each property value group, the line indicates that 90% of the households in that group have an ETR that falls within the range of the corresponding line. The ETR for 45% of the households will fall on the line above the median, while the ETR for another 45% will fall on the line below the median. A longer line indicates a wider range of ETRs, and less horizontal equity.

Consistent with the CV values above, Figure 4.9 shows that lower-value properties have a wider range of ETR values, while properties valued between about $80,000 and $200,000 have the smallest range of ETR values. Similar to the CV analysis, this suggests that horizontal equity under a LVT system would be lower for the lowest-valued properties.

Figure 4.9:



Section 5: Effects of a Land Value Tax on Vertical Equity: Evidence from Census Tract Income Data

All analysis in Section 4 uses property value as a measure of household permanent income. As noted earlier, property value as a measure of income had several advantages: the amount is taxpayer-specific, it is available for each year, and it may better reflect lifetime income than an annual income measure. However, it is also useful to examine how changes in tax liability resulting from a LVT are related to *annual* income measures. In this section, I perform analysis similar to Bowman and Bell (2008) using annual income measures from the *2000 U.S. Census Bureau*. This allows me to test the consistency of my results across income measures and to directly compare my results with those of Bowman and Bell (2008). They examine how moving from a property tax to a LVT would affect the tax distribution for single-family residential property owners in Roanoke, VA. As part of their analysis, they examine the correlation between the average change in property tax liability for a census tract and several census tract income and housing measures.

To use the census data, each individual parcel of real property must be matched to its corresponding census tract. Appendix B describes how I match the residential properties with their corresponding census tract. The census tract data are average annual measures for a group of households within a census tract. I use a census tract's income measure as a proxy for the income level of all residential properties in that census tract. The 2000 Census data only reports income measures for 1999, so my analysis is limited to the 3-year period 1998, 1999, and 2000. This assumes that the 1999 income measure is a good proxy for both 1998 and 2000, which seems a reasonable assumption.

After matching the properties with their census tract, I replicate Bowman and Bell's (2008) analysis using my sample of properties. For each individual property, I compute the change in tax liability of moving from a property tax to a revenue-neutral LVT. For each census tract, I compute the median change in tax liability using all properties in the census tract. I then compute the Spearman correlations between the median change in property tax liability for the census tracts and several census tract income and housing measures. Table 5.1 presents these correlations.

Note: I have matched all the properties but have not yet computed all the correlations for purposes of Table 5.1.

Section 6: Assessing the Awareness and Administrative Feasibility of a LVT System: Survey of Chief Appraisers

6.1 Sample and Survey Methodology

Moving from a uniform property tax system to a land value or split rate tax system would constitute dramatic tax reform, and would require widespread support from the government officials who administer the property tax system. Given their responsibilities, these officials are likely to view the LVT's administrative issues as the tax's most important aspect, even more important than equity and efficiency (Haveman 2004). Therefore, the second objective of this study is to survey appraisal district officials in order to: (i) assess their level of awareness of land value and split rate taxation, and (ii) evaluate their opinions regarding the administrative feasibility of a land value or split rate tax system.

In September 2008, I sent a survey to the chief appraiser for each of the 254 appraisal districts in the state of Texas.[9] The chief appraiser is the chief administrator of the appraisal district's office (*Texas Property Tax Code,* Section 6.05, 2006). I identified the chief appraisers from the *2007 Texas Comptroller Appraisal District Directory*. This directory also provided their mailing addresses.

Appendix B presents my survey instrument, including the cover letter. I mailed 254 surveys, and one survey was returned as undeliverable. I received responses from 134 chief appraisers, and only two surveys were not usable. This resulted in a final sample of 132 usable surveys, and a response rate of 52.0%. I did not send a second follow-up survey. The first page of the survey asked the administrators about their familiarity with LVT and split-rate taxation. The second page contained seven statements designed to elicit the chief appraisers' opinions on the administrative feasibility of a LVT system.

6.2 Survey Results

Table 6.1 presents selected characteristics of appraisal districts by whether or not their chief appraiser responded to the survey. Although there were 132 surveys with valid responses, two of the appraisers altered the form so that I could not identify their appraisal district. Accordingly, there are only 130 survey responses for tests that require identification of appraisal district characteristics.

Table 6.1 shows that the average (mean) total appraised value for districts of appraisers who responded to the survey is $8.88 billion, while the average appraised value for district of appraisers who did not respond to the survey is $5.55 billion. However, the values across groups are not significantly different. The average percentage of a district's property value represented by single-family residential properties is 30.3% for districts of responding appraisers, and 26.8% for districts of non-responding appraisers. The percentages across the two groups are not significantly different. Lastly, the average percentage of a district's property value attributable

[9] Texas is comprised of 254 appraisal districts, one appraisal district for each county. With few exceptions, an appraisal district's boundaries are the same as the county's boundaries.

to vacant land is a little over 17% for districts of both responding and non-responding appraisers. Overall, there does not appear to be significant response bias with respect to these appraisal district characteristics.

Table 6.2 shows the percentage of respondents who indicated that they were either *very familiar*, *somewhat familiar*, or *not familiar at all* with LVT and split-rate taxation. Slightly more than 8% of appraisers (n=11) said that they were *very familiar* with LVT, while 19.8% (n=26) said they were *somewhat familiar* with LVT. The remaining 71.8% (n=94) said they were *not familiar at all* with LVT. The pattern of results is similar for appraisers' familiarity with split-rate taxation, although even fewer appraisers expressed familiarity with split-rate taxation. Specifically, 7.6% of appraisers (n=10) were *very familiar* with split-rate taxation, 16.0% (n=21) were *somewhat familiar*, and 76.3% were *not familiar at all*.

Table 6.3 presents selected characteristics of appraisal districts by the appraiser's familiarity with either LVT or split-rate taxation. Appraisers who indicated they were *familiar* (very or somewhat) with either land value or split-rate taxation are employed by larger appraisal districts than appraisers who said they were *not familiar at all* with either form of taxation (average mean values of $13.7 billion versus $3.5 billion, and median values of $1.8 billion versus $1.3 billion). The difference in size across groups is significant at $p<0.10$. On average, districts of appraisers who said they were familiar with LVT or split-rate taxation have a greater percentage of single-family residential properties and a smaller percentage of value attributable to vacant land. However, these characteristics are not significantly different across the two groups.

Table 6.4 presents the mean and median response values for the seven statements regarding the administrative feasibility of LVT. The response scale ranged from 1 (strongly agree) to 5 (strongly disagree). The mean average response for all statements falls between 3.60 and 4.35. These results suggest that, on average, chief appraisers slightly disagree to slightly-more-than disagree to all statements. On average, appraisers do not agree with statements that:

- It would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property;
- The current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings;
- Relative to the current property tax system, property owners would prefer a system that taxed land at a higher rate than buildings; or
- A system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system.

Table 6.5 provides the complete distribution of responses for each statement. It is worth noting that, relative to the other statements, more appraisers responded *agree* or *strongly agree* to the statements suggesting that the current assessed values for land would be good estimates of land market value if the state switched to a LVT or split-rate tax system (S3 and S4). The strongest disagreement was indicated for Statement 1 and Statement 7. In response to Statement 1 regarding single-family residential property, 85.6% of appraisers said they disagreed or strongly disagreed with the statement that it would be easier to generate a defensible market value for only land versus generating a defensible market value for the total property. (A little over 77% of appraisers disagreed with this statement with respect to business property.) In response to

Statement 7, 81.8% of appraisers disagreed or strongly disagreed with the statement that a system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system.

The next table (Table 6.6) provides the mean response value for each statement, presented by whether the appraiser indicated s/he was *familiar*, *somewhat familiar* or *very familiar* with LVT. Results are not significantly different across groups for any of the statements except for Statement 5. For Statement 5, relative to appraisers who are *not familiar* with LVT, appraisers who are *somewhat familiar* with LVT disagree more with the statement that single-family residential property owners would prefer a system that taxed land at a higher rate than buildings. Results across groups divided by familiarity with split-rate taxation are essentially identical to those in Table 6.6 and are thus not tabulated.

Table 6.7 presents Spearman correlations between appraisal district characteristics and statement responses. The correlation between the log of appraisal district property value and the percentage of single-family residential property is significantly positive ($r=0.517$, $p<0.01$), and the correlation between the log of district property value and the percentage of vacant land is significantly negative ($r=-0.718$, $p<0.01$). This suggests that larger districts have a greater percentage of land value composed of single-family residential properties, and a smaller percentage of land value composed of vacant land. There is no significant correlation between district characteristics and statement responses except in four instances. For Statement 4, appraisers from larger districts and districts with a greater percentage of single-family residential properties are more likely to agree (less likely to disagree) with the statement that, "*For business property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings." For Statement 3, appraisers from larger districts and districts with less vacant land are more likely to agree (less likely to disagree) with the statement that, "*For single-family residential property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings." This could indicate that appraisers from larger districts have more confidence that they are currently assessing land at its market value—perhaps because of better-trained staff or more sophisticated assessment techniques.

Overall, the survey results can be summarized as follows:

- Almost 28% of appraisers said that they were *very familiar* or *somewhat familiar* with LVT. The remaining 72% said they were *not familiar at all* with LVT. The pattern of results is similar for appraisers' familiarity with split-rate taxation, although even fewer appraisers expressed familiarity with split-rate taxation.
- Appraisers who indicated they were *familiar* (very or somewhat) with either land value or split-rate taxation are employed by larger appraisal districts than appraisers who said they were *not familiar at all* with either form of taxation.
- On average, appraisers do <u>not</u> agree with statements suggesting that:
    - It would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property;

    - The current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings;
    - Relative to the current property tax system, property owners would prefer a system that taxed land at a higher rate than buildings; or
    - A system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system.
- Relative to the other statements, more appraisers responded *agree* or *strongly agree* to the statements suggesting that the current assessed values for land would be good estimates of land market value if the state switched to a LVT or split-rate tax system.
- There is some evidence to suggest that appraisers from larger districts are more likely to agree (less likely to disagree) that the current assessed land values would be good estimates of land market value if the state switched to a LVT or split-rate tax system.

7. Implications for Future Research

This study uses parcel-level property data for Tarrant County for the 10-year period 1997 through 2006 to examine how replacing a uniform property tax with a LVT would shift the tax burden. Although the study examines the effects of a LVT on the tax burden across and within the different property classes, the detailed analysis focuses on owner-occupied single-family residential properties. A significant contribution would be to extend the detailed analysis to commercial and industrial properties and examine how a LVT would shift the tax burden within these property classes.

This study surveys the chief appraisers in Texas in order to assess their current level of awareness of land value and split-rate taxation and obtain their opinions on the administrative feasibility of a land value tax system. A significant contribution would be to extend this survey to other appraiser groups. For example, the survey could be administered to members of the Texas Association of Appraisal Districts. TAAD is a statewide, voluntary non-profit organization that was established in 1981 to promote the effective and efficient functioning and administration of appraisal districts in Texas. TAAD's current membership totals approximately 3,000 persons and represents a wider audience of property tax officials and professionals.

Lastly, it would be useful to administer a second survey to gather information on the current land valuation practices in the 254 appraisal districts in Texas. The survey administered for purposes of this project did not ask appraisers about their district's land valuation practices. I wanted to increase the likelihood that appraisers would respond, so I kept the survey brief and straight-forward. A second survey, however, could focus specifically on land valuation issues.

REFERENCES

Bowman, J. H., and M. E. Bell. 2008. Distributional Consequences of Converting the Property Tax to a Land Value Tax: Replication and Extension of England and Zhao. *National Tax Journal*, forthcoming.

Brunori, D. 2003. Awareness of Land Taxation: Survey of State Legislators. Working Paper. Cambridge, MA: Lincoln Institute of Land Policy.

Congressional Budget Office (CBO). *Federal Taxation of Tobacco, Alcoholic Beverages, and Motor Fuels*. Washington, DC: Government Printing Office, 1990.

De Cesare, C.M., L.C.P. da Silva Filho, M.Y. Une, and S.C. Wendt. 2003. Analyzing the Feasibility of Moving to a Land Value-based Property Tax System: A Case Study from Brazil. Working Paper. Cambridge, MA: Lincoln Institute of Land Policy.

England, R. W., and M. Q. Zhao. 2005. Assessing the Distributive Impact of a Revenue-Neutral Shift from a Uniform Property Tax to a Two-Rate Property Tax with a Uniform Credit. *National Tax Journal* 48: 247-260.

Fullerton, D., and G.E. Metcalf. 2002. "Tax Incidence." In *Handbook of Public Economics*, Vol. 4, edited by A. Auerbach and M. Feldstein. Amsterdam: Elsevier.

Gravelle, J., and J. Gravelle. 2006. Horizontal Equity and Family Tax Treatment: The Orphan Child of Tax Policy. *National Tax Journal*: 631-649.

Grote, K.R. 2009. "Fairness and Distributional Issues," in *Land Value Taxation and Economic Development*, R. F. Dye (editor). Lincoln Institute of Land Policy, Cambridge, MA. Forthcoming 2009.

Haveman, M. 2004. Evaluating the Feasibility and Burden-Shifting Effects of a Statewide Land Value Tax on Commercial and Industrial Property. *State Tax Notes* 34 (11): 745-751.

International Association of Assessing Officers. 2007. *Standard on Ratio Studies*. Published on the IAAO's Technical Standards website at http://www.iaao.org/sitePages.cfm?Page=219.

Metcalf, G.E. "The Lifetime Incidence of State and Local Taxes: Measuring Changes During the 1980s." In *Tax Progressivity and Income Inequality*, edited by J. Slemrod, 59-94. Cambridge, England: Cambridge University Press, 1994.

Plummer, E. 2003. Evidence on the Incidence of Residential Property Taxes Across Households. *National Tax Journal*: 739-753.

Plummer, E. 2009. "Fairness and Distributional Issues," in *Land Value Taxation and Economic Development*, R. F. Dye (editor). Lincoln Institute of Land Policy, Cambridge, MA. Forthcoming 2009.

Poterba, J. "Lifetime Incidence and the Distributional Burden of Excise Taxes." *American Economic Review* 79 No. 2 (May, 1989): 325–330.

Poterba, J. "Is the Gasoline Tax Regressive?" In *Tax Policy and the Economy: Volume 5*, edited by D.F. Bradford, 145-164. Cambridge, MA: The MIT Press, 1991.

Schwartz, A. E. 1998. Analysis of Papers by Roy Bahl, Dick Netzer, Andrew Reschovsky, and Thomas Nechyba. In *Land Value Taxation: Can it and will it work today?* (D. Netzer, editor). Cambridge, MA, Lincoln Institute of Land Policy.

Suits, D. "Measurement of Tax Progressivity." *American Economic Review* 67 No. 4 (September, 1977): 747-752.

Appendix A: Calculating a Revenue-Neutral Land Value Tax Rate

The revenue-neutral LV tax rate used in this paper reflects the LV tax rate that would be required to generate tax revenue that is equal to the combined property tax revenues of the three primary taxing jurisdictions (county, school district, and city). Although all properties in my sample are in the same county (Tarrant), they are not in the same city and school district. Tarrant County covers approximately 864 square miles and includes 34 cities and 16 school districts. Each city and school district has a separate tax rate, which can also vary across years. Accordingly, for each year, I use the median city tax rate (of the 34 cities) and the median school district tax rate (of the 16 school districts) to proxy for the city and school district property tax rates for that specific year.

The first column of Table A-1 provides the actual property tax rate for Tarrant County for 1997 through 2006, the second column presents the median city property tax rate, and the third column presents the median school district property tax rate. Column (4) presents the sum of the three rates each year. The county tax rate is the lowest and approximates 0.27% each year. The school district tax rate is the highest, and ranges between 1.54% and 1.72% each year. The city tax rate ranges from 0.5090% to 0.5680%. The sum of these three rates is approximately 2.4% each year.

Column (5) provides the total assessed market value of all taxable real property in Tarrant County for each year, and these amounts are equal to the "total market value" amounts in Table 2.1. Column (5) excludes tax-exempt properties (owned by churches, charities, and governments) and agricultural properties (ranch and farmland, timberland, undeveloped agricultural land). I exclude tax-exempt properties because these properties would likely remain tax-exempt under a LVT system. Similarly, the Texas Constitution and Tax Code provide for the appraisal of agricultural land based on the land's ability to produce agricultural products.[1] This results in taxable values that are substantially less than market values and significantly reduces the property tax liabilities for agricultural properties. It is likely that some form of an agricultural exemption would persist under a LVT system. It should be noted that Column (5) reflects market values *before* deductions such as homestead exemptions, over-65 exemptions, tax abatements, and assessment caps. Column (6) provides the annual total property tax liability generated by the total property value in Column (5). [This tax liability amount is simply Column (4) times Column (5).]

Column (7) presents, for each year, the total market value of the land for the properties that are included in Column (5). These land value amounts are equal to the "total land value" amounts in Table 2.1. To generate an implied neutral LVT rate for each year, I divide total property tax liability by total market value of land [i.e., Column (6) divided by Column (7)]. The values in Column (8) are the amounts used as the land value tax rates that would generate the same total property tax liability as the current property tax rates.

[1] See Article 8, Sec. 1-d-1, of the Texas Constitution, and Chapter 23, Subchapter D, of the Tax Code. Land qualifies for 1-d-1 appraisal if it has been used for agriculture in the past and is currently used for agriculture at the same level as typical prudent producers in the surrounding area.

TABLE A-1
Calculation of Revenue Neutral Land Value Tax Rate
(dollars in millions)

	Tarrant Co. property tax rate[1]	Median city property tax rate[1]	Median school district property tax rate[1]	Total of three property tax rates	Total MV of taxable real property[2]	Total property tax liability on column (5)[3]	Total MV of land for properties in column (5)	Implied neutral LVT rate[4]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1997	0.264836	0.5680	1.5439	2.3767	$41,157	978.2	$10,942	8.9398
1998	0.264836	0.5460	1.5443	2.3551	44,875	1,056.8	11,689	9.0413
1999	0.264836	0.5558	1.5536	2.3742	48,882	1,160.7	12,485	9.2957
2000	0.274785	0.5503	1.6183	2.4434	55,071	1,345.6	13,492	9.9734
2001	0.274785	0.5113	1.6205	2.4066	62,108	1,494.7	14,741	10.1394
2002	0.272500	0.5205	1.6558	2.4488	69,660	1,705.9	15,705	10.8622
2003	0.272500	0.5206	1.6689	2.4620	74,979	1,846.0	16,461	11.2144
2004	0.272500	0.5264	1.6988	2.4977	79,530	1,986.3	17,507	11.3460
2005	0.272500	0.5050	1.7194	2.4969	86,416	2,157.7	18,923	11.4026
2006	0.271500	0.5090	1.6028	2.3833	93,743	2,234.2	20,585	10.8534
Average	*0.270558*	*0.5313*	*1.6226*	*2.4245*				*10.3069*

[1] Tax rates are expressed in percentages (e.g., 0.264836%). The Tarrant County property tax rate is the actual tax rate imposed each year. The "median city property tax rate" is the median rate for the 34 cities located in Tarrant County, and the "median school district property tax rate" is the median rate for the 16 independent school districts located in Tarrant County.
[2] MV=market value. This column excludes tax-exempt properties (owned by churches, charities, and governments) and agricultural properties (ranch and farmland, timberland, undeveloped agricultural land).
[3] "Total property tax liability" is column 4 times column 5.
[4] "Implied neutral LVT rate" is column 6 divided by column 7.

Appendix B: Matching of Residential Properties with Census Tract

The tax roll data and census data cannot be easily combined because the tax roll data does not have a specific variable to indicate in which census tract a property is located. However, the tax roll data does have a data item which corresponds to the 'neighborhood' in which the property is located, and a neighborhood is a smaller geographic area than a census tract. (Tarrant Appraisal District has 472 census tracts and 5,636 neighborhoods.) Therefore, I identified which census tract a property belongs to by identifying the census tract that its neighborhood belongs to. I did this as follows:

1. I determined how many single-family properties were in each neighborhood. The results are as follows:

Number of single-family properties in neighborhood	Number of neighborhoods this size	Total # of properties
Less than 20 properties	3,464	18,435
20 to 50 properties	875	28,263
51 to 100 properties	556	39,718
101 to 200 properties	413	58,469
Greater than 200 properties	328	131,401
Total	5,636	276,286

2. Because I had to manually look up the census tract for each neighborhood, I wanted to reduce this to a manageable size. Therefore, I deleted all neighborhoods that have fewer than 20 properties. By doing this, I reduced the number of neighborhoods from 5,636 to 2,172, and lost only 18,435 properties (6.7% of sample). The reduced sample size is 257,851 properties located in 2,172 different neighborhoods. Therefore, I only had to determine the census tract for 2,172 neighborhoods (versus 5,636).

3. For each of the 2,172 neighborhoods, I identified a property that had a market value equal (or closest) to the median value for that neighborhood.

4. I identified the census tract that this median property was located in using the website: http://www.nctcog.org/ris/census/searchtract.asp. This was done manually, and a research assistant helped me with this step.

5. In my empirical analysis, I use the census tract identified for the median neighborhood property as the census tract for all properties in the neighborhood.

6. I was concerned that larger neighborhoods (i.e., those with greater than 200 properties) might be located in more than one census tract. Therefore, I broke these neighborhoods down into smaller geographic areas using a geographic identifier provided on the tax roll database. For each property, the tax roll provides the MAPSCO grid cell in which a property is located. (MAPSCO is a Dallas-based company that produces physical map books, where geographic areas are broken down into grid cells that cover approximately 0.25 square miles.) Therefore, for each of the 328 large neighborhoods, I identified the

median-valued property for each separate MAPSCO grid cell that the neighborhood covers. The 328 neighborhoods covered 773 MAPSCO grid cells. I then identified the census tract that each of the 773 properties was located in using the website indicated above. For properties in the 328 large neighborhoods, I used the census tract which corresponds to the MAPSCO grid cell in which the property is located.

Appendix C: Cover Letter and Survey Instrument

September 3, 2008

Dear Chief Appraiser, _____:

I am writing from the Neeley School of Business at Texas Christian University to request your participation in a survey of the Chief Appraiser for each of the 254 appraisal districts in the state of Texas. This survey is short and should take 5-10 minutes to complete.

This survey contains questions related to land value taxation and split-rate taxation. These are both alternatives to our current property tax system, which taxes land and buildings at the same rate. Land value taxation is a property tax system which taxes the full market value of land, but does not tax buildings and improvements. Split-rate taxation is a variation of the land value tax. Both land and buildings are taxed, but land is taxed at a higher rate than buildings.

Through this study, I hope to gain knowledge about your awareness regarding land value taxation, and your opinion on the administrative advantages or difficulties that might arise from implementing a land value or split-rate tax system.

I hope that you will be able to help me in this project by completing the enclosed survey and returning it in the provided business reply envelope.

If you have questions, I would be happy to answer them. I can be reached at (817) 257-5104 or c.e.plummer@tcu.edu.

Thank you in advance for your assistance. While I don't have the resources to compensate you, please know that I do value and appreciate your time.

Sincerely,

Elizabeth Plummer, PhD, CPA
Associate Professor of Accounting

If you have questions about your rights as a participant in research, please contact Dr. Timothy Hubbard, Chairperson of the TCU Institutional Review Board (817.257.7410; t.hubbard@tcu.edu), or Dr. Janis Morey, Director of the TCU Office of Research and Sponsored Projects (817.257.7516; j.morey@tcu.edu).

Chief Appraisers in Texas: Survey Regarding Land Value and Split-Rate Taxation

This survey is intended to gain knowledge about your awareness regarding land value and split-rate taxation, and your opinion on the administrative advantages or difficulties that might arise from implementing a land value or split-rate tax system. Please respond honestly and objectively to each item. Your individual results will not be made public. Results from all surveys will be combined, and only aggregate, non-identifying results will be used in any publications resulting from this project.

Your participation in this survey is voluntary. There are no known risks or rewards involved for participating, and no penalties for not responding. By completing and returning the enclosed survey, you will have indicated your consent to participate in the survey, and no further information will be requested. Completed surveys will be kept in a locked cabinet by the researcher.

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1. Before receiving this survey, were you familiar with the concept of *land value taxation*? (Land value taxation is a property tax system which taxes the full market value of land, but does not tax buildings and improvements.)

   Very Familiar ☐ Somewhat Familiar ☐ Not Familiar at All ☐

2. Before receiving this survey, were you familiar with the concept of *split-rate taxation*? (Split-rate taxation is a variation of the land value tax. Both land and buildings are taxed, but land is taxed at a higher rate than buildings.)

   Very Familiar ☐ Somewhat Familiar ☐ Not Familiar at All ☐

For each of the following independent statements, please indicate whether you strongly agree, agree, are neutral, disagree, or strongly disagree with the statement as it applies to your specific appraisal district. Please indicate by circling the number which corresponds to your response.

	Strongly Agree	*Agree*	*Neutral (neither agree nor disagree)*	*Disagree*	*Strongly Disagree*
For single-family residential property, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…..…….....	1	2	3	4	5
For business property, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…….....	1	2	3	4	5
For single-family residential property, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings…….…....	1	2	3	4	5
For business property, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings…….….....	1	2	3	4	5
Relative to the current property tax system, *single-family residential property owners* would prefer a system that taxed land at a higher rate than buildings…….	1	2	3	4	5
Relative to the current property tax system, *business property owners* would prefer a system that taxed land at a higher rate than buildings…….….....	1	2	3	4	5
A system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system……	1	2	3	4	5

Please return your completed questionnaire in the business reply envelope provided. Thank you very much for your participation.

TABLE 2.0
Assessment Uniformity Measures for Tarrant Appraisal District[1]

	Overall			Single-Family Residences		
	Median	**COD**	**PRD**	**Median**	**COD**	**PRD**
1997	n/a	n/a	n/a	n/a	n/a	n/a
1998	n/a	n/a	n/a	n/a	n/a	n/a
1999	0.96	6.33	1.00	0.96	4.06	1.00
2000	0.97	6.43	0.99	0.96	3.24	1.00
2001	0.98	7.78	1.00	0.96	5.44	1.00
2002	1.00	6.38	1.01	1.00	4.79	1.00
2003	1.00	7.99	1.03	0.99	6.76	1.01
2004	1.00	5.63	1.04	1.01	3.92	1.00
2005	1.00	6.65	1.02	1.00	5.12	1.01
2006	0.99	6.20	1.03	0.99	5.01	1.00
Average	*0.99*	*6.67*	*1.02*	*0.98*	*4.79*	*1.00*

Median = Median appraisal ratio. Measures the accuracy of an appraisal district's appraisals in relation to the standard of 100% of market value. A median of 1.0 suggests that the sample properties are appraised at 100% of market value.

COD = Coefficient of dispersion. Measures whether appraisal districts are appraising properties at an equal percentage of market value. A smaller COD value suggests greater uniformity.

PRD = Price-related differential. Measures the vertical inequity that may arise from systematic differences in the appraisal of low-value and high-value properties. A value above (below) 1.0 suggests that lower-value properties (higher-value properties) are generally over-assessed.

[1] These values are obtained from the *Texas Comptroller's Annual Property Value Study* (years 1997 through 2006).

TABLE 2.1
Descriptive Information on All Real Properties in Tarrant County, excluding tax exempt properties and agricultural properties[1] (dollars in millions)

Year	Number of Properties	Total Land Value	Total Improvement Value	Total Market Value	Land Value/Total Value Ratio		
					Mean	Median	C.V.[2]
1997	453,256	$10,942	$30,215	$41,157	0.3475	0.2235	83.8
1998	458,771	11,689	33,186	44,876	0.3377	0.2154	85.5
1999	469,570	12,485	36,397	48,882	0.3336	0.2088	87.2
2000	488,126	13,492	41,579	55,071	0.3153	0.1947	92.7
2001	499,709	14,741	47,367	62,109	0.3020	0.1812	97.0
2002	512,835	15,705	53,955	69,660	0.2860	0.1653	102.7
2003	527,063	16,461	58,518	74,979	0.2787	0.1600	105.1
2004	543,510	17,507	62,023	79,530	0.2781	0.1594	105.4
2005	561,841	18,923	67,493	86,416	0.2791	0.1601	105.4
2006	578,574	20,585	73,158	93,742	0.2832	0.1633	104.0
10-year growth	*27.6%*	*88.1%*	*142.1%*	*127.8%*	*(18.5%)*	*(26.9%)*	*24.1%*

10-year growth in Consumer Price Index (CPI) for Dallas-Fort Worth area: 25.6%

[1] These values are assessed market values from the TAD database. The last three columns present statistics for the land value ratios (Land Value/Total Value) computed separately for each property.
[2] C.V. = coefficient of variation.

TABLE 2.2
Number of Parcels for Each Property Class

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	10-year growth
Single-family residential	350,782	357,483	365,943	376,073	385,590	396,624	408,983	422,500	435,813	448,146	*27.8%*
Multi-family residential	16,439	16,440	16,363	16,369	16,451	16,599	16,860	17,012	17,140	17,153	*4.3%*
Vacant lots and tracts	52,474	50,456	52,580	51,997	51,068	48,387	46,081	43,910	42,648	42,718	*(18.6%)*
Commercial	20,328	20,653	21,007	21,070	21,421	21,762	22,112	22,961	23,431	23,765	*16.9%*
Industrial	794	793	792	785	830	862	872	885	881	861	*8.4%*
Utilities	1,755	1,753	1,699	1,697	1,710	1,724	1,710	1,724	1,727	1,710	*(2.6%)*
Mobile Homes	947	1,014	1,031	9,229	9,344	9,462	9,682	9,511	9,860	9,891	*944.5%*
Residential Inventory	9,737	10,179	10,155	10,906	13,295	17,415	20,763	25,007	30,341	34,330	*252.6%*
Total	453,256	458,771	469,570	488,126	499,709	512,835	527,063	543,510	561,841	578,574	*27.6%*

TABLE 2.3
Total Market Value for Each Property Class (dollars in millions)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	10-year growth
Single-family residential	$26,760	$28,671	$31,102	$34,588	$38,985	$45,168	$49,454	$53,162	$56,944	$61,262	*128.9%*
Multi-family residential	3,112	3,454	3,813	4,177	4,604	4,874	5,551	5,382	6,372	6,861	*120.5%*
Vacant lots and tracts	1,109	1,207	1,311	1,432	1,548	1,546	1,488	1,517	1,666	1,873	*68.9%*
Commercial	8,968	10,239	11,299	13,161	14,945	15,725	16,038	16,740	18,342	20,416	*127.7%*
Industrial	842	900	925	1,063	1,126	1,165	1,081	1,203	1,244	1,242	*47.5%*
Utilities	154	161	164	170	171	164	162	175	175	184	*19.5%*
Mobile Homes	9	10	11	117	212	220	230	227	231	215	*2288.9%*
Residential Inventory	204	234	257	363	518	799	974	1,125	1,440	1,689	*727.9%*
Total	$41,157	$44,876	$48,882	$55,071	$62,109	$69,660	$74,979	$79,530	$86,416	$93,742	*127.8%*
CPI for Dallas-Fort Worth	100.0	101.45	104.36	108.78	112.55	114.07	116.38	118.03	121.99	125.56	*25.6%*

TABLE 2.4
Percentage of Total Market Value Represented by Each Property Class

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average across years
Single-family residential	65.0%	63.9%	63.6%	62.8%	62.8%	64.8%	66.0%	66.8%	65.9%	65.4%	*64.70%*
Multi-family residential	7.6%	7.7%	7.8%	7.6%	7.4%	7.0%	7.4%	6.8%	7.4%	7.3%	*7.40%*
Vacant lots and tracts	2.7%	2.7%	2.7%	2.6%	2.5%	2.2%	2.0%	1.9%	1.9%	2.0%	*2.32%*
Commercial	21.8%	22.8%	23.1%	23.9%	24.1%	22.6%	21.4%	21.0%	21.2%	21.8%	*22.37%*
Industrial	2.0%	2.0%	1.9%	1.9%	1.8%	1.7%	1.4%	1.5%	1.4%	1.3%	*1.69%*
Utilities	0.4%	0.4%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	*0.27%*
Mobile Homes	0.0%	0.0%	0.0%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	*0.19%*
Residential Inventory	0.5%	0.5%	0.5%	0.7%	0.8%	1.1%	1.3%	1.4%	1.7%	1.8%	*1.03%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

TABLE 3.1
Percentage of Land Value Represented by Each Property Class

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average across years
Single-family residential	54.6%	53.2%	52.3%	50.9%	49.5%	49.3%	50.1%	50.5%	50.9%	50.9%	*51.22%*
Multi-family residential	4.8%	4.8%	4.7%	4.6%	4.6%	4.5%	4.7%	4.5%	4.5%	4.4%	*4.61%*
Vacant lots and tracts	10.1%	10.3%	10.5%	10.6%	10.5%	9.8%	9.0%	8.7%	8.8%	9.1%	*9.74%*
Commercial	26.9%	28.0%	28.8%	29.8%	31.0%	31.3%	30.9%	30.6%	29.6%	29.1%	*29.60%*
Industrial	1.5%	1.5%	1.6%	1.5%	1.5%	1.6%	1.4%	1.4%	1.3%	1.3%	*1.46%*
Utilities	0.7%	0.7%	0.6%	0.5%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	*0.50%*
Mobile Homes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	*0.00%*
Residential Inventory	1.5%	1.5%	1.5%	2.0%	2.4%	3.1%	3.5%	4.0%	4.6%	4.8%	*2.89%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

TABLE 3.2
Tax Liabilities for the Current Property Tax and a Revenue-Neutral Land Value Tax, by Property Class for 2006

	Tax Liability (dollars)		Percentage Distribution		Percent Change in Tax Liability
	Current Tax	Land Value Tax	Current Tax	Land Value Tax	
Single-family residential	1,460,054,470	1,137,047,616	65.4%	50.9%	-22.1%
Multi-family residential	163,527,371	99,394,440	7.3%	4.4%	-39.2%
Vacant lots and tracts	44,643,001	203,190,659	2.0%	9.1%	355.1%
Commercial	486,582,693	650,363,003	21.8%	29.1%	33.7%
Industrial	29,590,127	28,129,864	1.3%	1.3%	-4.9%
Utilities	4,379,871	8,172,088	0.2%	0.4%	86.6%
Mobile Homes	5,115,616	0	0.2%	0.0%	-100.0%
Residential Inventory	40,262,299	107,823,837	1.8%	4.8%	167.8%
Total	2,234,155,448	2,234,121,506	100%	100%	0.0%

TABLE 3.3
Within-Class Variation in Change in Tax Liabilities from Replacing Current Property Tax with a Revenue-Neutral Land Value Tax, by Property Class for 2006

	Percent Change in Tax Liabilities for Individual Parcels				% properties with tax increase	Coefficient of Variation
	Mean	Median	10% Quantile	90% Quantile		
Single-family residential	-21.5%	-30.4%	-53.8%	13.7%	14.9%	-201.8
Multi-family residential	-31.3%	-41.9%	-70.9%	14.0%	14.0%	-151.6
Vacant lots and tracts	355.3%	355.4%	355.4%	355.4%	100.0%	1.3
Commercial	88.4%	56.3%	-48.6%	297.2%	69.7%	141.3
Industrial	19.2%	-10.7%	-59.9%	140.5%	44.0%	471.1
Utilities	321.3%	355.4%	245.3%	355.4%	95.1%	31.6
Mobile Homes	-100.0%	-100.0%	-100.0%	-100.0%	0.0%	0.0
Residential Inventory	292.9%	355.4%	8.7%	355.4%	91.9%	45.0
Total for all properties combined	29.0%	-25.7%	-54.9%	355.4%	28.0%	463.0

TABLE 4.1
Descriptive Information for Owner-Occupied Single-Family Residential Properties in Tarrant County
(dollars in millions)

Year	Number of Properties	Total Land Value	Total Improvement Value	Total Market Value	Land Value/Total Value Ratio		
					Mean	Median	C.V.
1997	249,731	$4,701	$16,656	$21,358	0.2248	0.2047	44.2
1998	250,210	4,811	17,749	22,560	0.2175	0.1983	44.0
1999	257,690	5,077	19,491	24,568	0.2116	0.1916	44.9
2000	273,377	5,485	22,589	28,075	0.1992	0.1806	45.7
2001	282,180	5,829	25,886	31,715	0.1848	0.1683	44.8
2002	296,394	6,294	30,983	37,276	0.1679	0.1538	44.3
2003	301,087	6,581	33,436	40,018	0.1626	0.1497	44.8
2004	310,062	6,997	35,715	42,712	0.1617	0.1489	44.5
2005	326,401	7,755	38,824	46,579	0.1629	0.1496	46.0
2006	330,835	8,254	40,828	49,082	0.1660	0.1515	45.8
10-year growth	*32.5%*	*75.6%*	*145.1%*	*129.8%*	*(26.2%)*	*(26.0%)*	*3.6%*

10-year growth in CPI for Dallas-Fort Worth area: 25.6%

TABLE 4.2
Effect on Tax Liability of Changing from a Property Tax to Land Value Tax System:
Owner-Occupied Single-Family Residential Properties

	Property Tax Liability		Land Value Tax Liability		Change in Tax Liability		%age □ in Tax Liability		% properties with increase in tax liability
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	
1997	$2,033	$1,676	$1,683	$1,341	($350)	($348)	(15.4%)	(23.0%)	20.5%
1998	2,123	1,757	1,738	1,401	(385)	(381)	(16.5%)	(23.9%)	19.0%
1999	2,264	1,859	1,831	1,487	(432)	(424)	(17.1%)	(25.0%)	18.5%
2000	2,509	2,067	2,001	1,596	(508)	(499)	(18.7%)	(26.3%)	16.4%
2001	2,705	2,214	2,095	1,622	(610)	(600)	(22.2%)	(29.1%)	13.9%
2002	3,080	2,537	2,307	1,792	(773)	(758)	(25.5%)	(31.8%)	11.2%
2003	3,272	2,730	2,451	1,906	(821)	(815)	(25.9%)	(31.8%)	10.8%
2004	3,441	2,877	2,560	1,940	(880)	(876)	(26.6%)	(32.3%)	10.6%
2005	3,563	2,961	2,709	2,052	(854)	(875)	(25.6%)	(31.7%)	11.3%
2006	3,536	2,920	2,708	1,954	(828)	(841)	(24.4%)	(31.0%)	12.7%
Average							*(21.8%)*	*(28.6%)*	*14.5%*

TABLE 4.3
Effect on Tax Liability by Property Wealth Group:
Owner-Occupied Single-Family Residential Properties

	1997 (n=249,731)		1998 (n=250,210)		1999 (n=257,690)	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
Highest-valued 30% of properties						
Property Value (land + structures)	$156,726	$131,500	$164,500	$137,700	$174,867	$145,500
Change in tax liability	($704)	($883)	($752)	($929)	($846)	($1035)
%age change in tax liability	(20.3%)	(28.8%)	(20.9%)	(28.9%)	(21.8%)	(30.0%)
% properties with tax increase	13.3%		13.1%		12.6%	
Middle 40% of properties						
Property Value (land + structures)	$71,516	$70,600	$75,427	$74,600	$79,458	$78,300
Dollar change in tax liability	($297)	($370)	($336)	($409)	($381)	($460)
%age change in tax liability	(17.1%)	(21.6%)	(18.7%)	(22.9%)	(19.9%)	(24.5%)
% properties with tax increase	14.6%		12.5%		11.5%	
Lowest-valued 30% of properties						
Property Value (land + structures)	$33,057	$33,900	$35,480	$36,630	$36,981	$38,500
Dollar change in tax liability	($66)	($101)	($83)	($119)	($86)	($124)
%age change in tax liability	(8.3%)	(13.9%)	(9.1%)	(15.7%)	(8.8%)	(15.7%)
% properties with tax increase	35.6%		33.4%		33.9%	

TABLE 4.3 (continued)
Effect on Tax Liability by Property Wealth Group:
Owner-Occupied Single-Family Residential Properties

	2000 (n=273,377)		2001 (n=282,180)		2002 (n=296,394)	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
Highest-valued 30% of properties						
Property Value (land + structures)	$186,965	$155,000	$203,131	$167,800	$223,948	$184,300
Change in tax liability	($949)	($1147)	($1098)	($1297)	($1304)	($1505)
%age change in tax liability	(22.1%)	(30.2%)	(23.9%)	(32.2%)	(25.3%)	(33.3%)
% properties with tax increase	12.6%		12.2%		11.7%	
Middle 40% of properties						
Property Value (land + structures)	$85,903	$84,500	$93,849	$92,100	$105,448	$103,600
Dollar change in tax liability	($463)	($543)	($551)	($645)	($715)	($807)
%age change in tax liability	(22.0%)	(26.1%)	(24.3%)	(29.0%)	(27.7%)	(31.9%)
% properties with tax increase	9.5%		8.3%		6.5%	
Lowest-valued 30% of properties						
Property Value (land + structures)	$40,823	$43,100	$46,490	$49,700	$54,700	$58,600
Dollar change in tax liability	($127)	($169)	($203)	($242)	($320)	($362)
%age change in tax liability	(10.9%)	(19.2%)	(17.5%)	(24.2%)	(22.8%)	(29.0%)
% properties with tax increase	29.4%		23.1%		17.0%	

TABLE 4.3 (continued)
Effect on Tax Liability by Property Wealth Group:
Owner-Occupied Single-Family Residential Properties

	2003 (n=301,087)		2004 (n=310,062)		2005 (n=326,401)	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
Highest-valued 30% of properties						
Property Value (land + structures)	$233,555	$192,000	$240,816	$197,300	$250,458	$203,900
Change in tax liability	($1334)	($1551)	($1400)	($1623)	($1304)	($1612)
%age change in tax liability	(24.8%)	(32.6%)	(24.9%)	(32.7%)	(22.5%)	(31.4%)
% properties with tax increase	11.8%		11.8%		13.2%	
Middle 40% of properties						
Property Value (land + structures)	$112,439	$110,900	$116,763	$115,200	$120,052	$118,600
Dollar change in tax liability	($770)	($834)	($839)	($929)	($827)	($933)
%age change in tax liability	(27.8%)	(31.7%)	(28.9%)	(32.3%)	(27.7%)	(31.7%)
% properties with tax increase	6.5%		6.0%		7.3%	
Lowest-valued 30% of properties						
Property Value (land + structures)	$59,687	$64,400	$62,620	$67,700	$65,300	$70,800
Dollar change in tax liability	($376)	($420)	($415)	($457)	($442)	($488)
%age change in tax liability	(24.5%)	(31.0%)	(25.2%)	(31.8%)	(25.8%)	(31.9%)
% properties with tax increase	15.5%		15.4%		14.7%	

TABLE 4.3 (continued)
Effect on Tax Liability by Property Wealth Group:
Owner-Occupied Single-Family Residential Properties

	2006 (n=330,835)	
	Mean	**Median**
Highest-valued 30% of properties		
Property Value (land + structures)	$261,719	$211,800
Change in tax liability	($1304)	($1597)
%age change in tax liability	(22.5%)	(31.6%)
% properties with tax increase	13.4%	
Middle 40% of properties		
Property Value (land + structures)	$123,777	$122,500
Dollar change in tax liability	($794)	($897)
%age change in tax liability	(27.0%)	(31.1%)
% properties with tax increase	8.1%	
Lowest-valued 30% of properties		
Property Value (land + structures)	$67,741	$73,400
Dollar change in tax liability	($397)	($457)
%age change in tax liability	(22.7%)	(29.7%)
% properties with tax increase	17.9%	

TABLE 4.4
Suits Indices for a Land Value Tax System:
Owner-Occupied Single-Family Residential Properties

Year	# of properties	Suits Index
1997	249,731	-0.0125
1998	250,210	-0.0090
1999	257,690	-0.0099
2000	273,377	-0.0035
2001	282,180	0.0031
2002	296,394	0.0143
2003	301,087	0.0188
2004	310,062	0.0224
2005	326,401	0.0295
2006	330,835	0.0226

TABLE 4.5
Descriptive Statistics on Effective Tax Rates under a LVT System: Tax Year 2006

Group	No. of Properties	Range of Property Values	Median ETR	Coef. of Var. for ETR	5% Quantile	95% Quantile
1	2,527	$ 10,000-20,000	0.015	91	0.006	0.071
2	4,477	20,000-30,000	0.012	88	0.005	0.052
3	6,513	30,000-40,000	0.015	74	0.006	0.045
4	8,480	40,000-50,000	0.021	57	0.005	0.039
5	9,936	50,000-60,000	0.019	55	0.005	0.036
6	12,152	60,000-70,000	0.018	48	0.007	0.031
7	16,906	70,000-70,000	0.017	43	0.007	0.028
8	23,228	80,000-90,000	0.016	39	0.009	0.026
9	25,974	90,000-100,000	0.017	36	0.010	0.025
10	25,130	100,000-110,000	0.017	34	0.010	0.026
11	23,806	110,000-120,000	0.016	35	0.011	0.026
12	22,606	120,000-130,000	0.016	35	0.011	0.026
13	19,952	130,000-140,000	0.016	34	0.012	0.026
14	17,242	140,000-150,000	0.016	38	0.011	0.027
15	14,807	150,000-160,000	0.016	37	0.011	0.026
16	13,052	160,000-170,000	0.016	40	0.011	0.028
17	10,721	170,000-180,000	0.016	42	0.011	0.029
18	8,939	180,000-190,000	0.016	43	0.011	0.030
19	7,362	190,000-200,000	0.016	44	0.011	0.032
20	13,603	200,000-225,000	0.016	47	0.011	0.035
21	9,598	225,000-250,000	0.016	49	0.011	0.036
22	6,764	250,000-275,000	0.017	51	0.011	0.040
23	4,900	275,000-300,000	0.017	47	0.011	0.038
24	3,875	300,000-325,000	0.017	48	0.011	0.037
25	3,062	325,000-350,000	0.017	47	0.011	0.037
26	2,840	350,000-375,000	0.017	48	0.011	0.037
27	2,125	375,000-400,000	0.017	50	0.011	0.039
28	1,480	400,000-425,000	0.016	50	0.010	0.039
29	1,235	425,000-450,000	0.016	53	0.010	0.039
30	997	450,000-475,000	0.016	50	0.011	0.039
31	801	475,000-500,000	0.016	52	0.011	0.040
32	1,238	500,000-550,000	0.016	55	0.011	0.041
33	973	550,000-600,000	0.015	53	0.010	0.042
34	763	600,000-650,000	0.015	52	0.011	0.041
35	588	650,000-700,000	0.016	52	0.010	0.041
36	379	700,000-750,000	0.017	53	0.010	0.044
37	271	750,000-800,000	0.018	54	0.009	0.043
38	221	800,000-850,000	0.017	48	0.010	0.039
39	158	850,000-900,000	0.016	53	0.009	0.041
40	134	900,000-950,000	0.020	58	0.009	0.046
41	87	950,000-1,000,000	0.020	40	0.010	0.040
42	312	1,000,000-1,250,000	0.020	50	0.010	0.043
43	167	1,250,000-1,500,000	0.020	47	0.010	0.042
44	67	1,500,000-1,750,000	0.020	55	0.008	0.049
45	37	1,750,000-2,000,000	0.020	56	0.006	0.058

TABLE 5.1
Spearman Correlations between Change in Tax Liability and Various Income and Housing Statistics

Income Statistics	**1998**	**1999**	**2000**
Per capita money income			
Median family income			
Poverty rate for families			
Poverty rate for individuals			

Housing Statistics	**1998**	**1999**	**2000**
Housing units per square mile			
Median number of rooms per housing unit			
%age of housing units built since 1990			
%age of housing units built before 1940			
%age of housing units with more than one person per room			
Occupancy rate for housing units			
%age of occupied housing units that are owner-occupied			

TABLE 6.1
Appraisal District Characteristics and Response Rate to Survey

	Responded to Survey (n=130)[1]	Did Not Respond (n=124)
Appraised Value (in millions):		
Mean	$8,881	$5,552
Median	$1,501	$1,333
St. Dev.	($33,694)	($17,213)
% single-family residential property:		
Mean	0.303	0.268
Median	0.282	0.252
St. Dev.	(0.187)	(0.179)
% of value attributable to vacant land:		
Mean	0.178	0.171
Median	0.145	0.139
St. Dev.	(0.148)	(0.135)

[1] There were 132 surveys with valid responses, but 2 of the appraisers altered the form so that I could not identify the appraisal district. Averages across the two groups are not significantly different at conventional levels, using either parametric or non-parametric tests.

TABLE 6.2
Familiarity with Land Value Taxation and Split-Rate Taxation (n=131)[1]

	Land Value Taxation		Split-Rate Taxation	
	Number	*Percentage*	*Number*	*Percentage*
Not Familiar at All	94	*71.8%*	100	*76.3%*
Somewhat Familiar	26	*19.8%*	21	*16.0%*
Very Familiar	11	*8.4%*	10	*7.6%*
Total	131	*100.0%*	131	*100.0%*

[1] Of the 132 responding surveys, one of the appraisers did not answer the questions regarding familiarity.

TABLE 6.3
Appraisal District Characteristics and Familiarity with Land Value Taxation and Split-Rate Taxation

	Familiar (n=39)[1]	Not Familiar (n=91)
*Appraised Value (in millions):**		
Mean	$13,709	$3,475
Median	$1,803	$1,319
St. Dev.	($36,039)	($7,444)
% single-family residential property:		
Mean	0.330	0.286
Median	0.337	0.248
St. Dev.	(0.186)	(0.189)
% of value attributable to vacant land:		
Mean	0.159	0.187
Median	0.109	0.159
St. Dev.	(0.136)	(0.153)

* The median appraised value is significantly greater at $p<0.10$ for appraisers who said they were familiar with either LVT or split-rate taxation (using the Savage two-sample test). Averages across the two groups for other measures are not significantly different at conventional levels, using either parametric or non-parametric tests.

[1] The respondent indicated that s/he was either "very familiar" or "somewhat familiar" with either LVT, split-rate taxation, or both.

TABLE 6.4
Survey Results on Administrative Feasibility of Land Value Taxation
(N=132)

Statement		Mean	Median	Std. Dev.
S1	*For single-family residential property*, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…..…….....	4.28	5.0	0.99
S2	*For business property*, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…….....	4.11	4.0	1.03
S3	*For single-family residential property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings……....	3.60	4.0	1.18
S4	*For business property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings…….....	3.66	4.0	1.16
*S5**	Relative to the current property tax system, *single-family residential property owners* would prefer a system that taxed land at a higher rate than buildings…….	4.02	4.0	0.93
S6	Relative to the current property tax system, *business property owners* would prefer a system that taxed land at a higher rate than buildings…….....	3.95	4.0	1.02
S7	A system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system……	4.35	5.0	0.87

Note: Only 131 respondents answered Statement 3.

TABLE 6.5
Survey Results on Administrative Feasibility: Distribution Across Responses

Statement		*Strongly Agree*	*Agree*	*Neutral (neither agree nor disagree)*	*Disagree*	*Strongly Disagree*
S1	*For single-family residential property*, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…..…….....	*2.3%* (n=3)	*6.8%* (n=9)	*5.3%* (n=7)	*31.8%* (n=42)	*53.8%* (n=71)
S2	*For business property*, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…….....	*0.8%* (n=1)	*10.6%* (n=14)	*11.4%* (n=15)	*31.8%* (n=42)	*45.5%* (n=60)
S3	*For single-family residential property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings…….....	*1.5%* (n=2)	*23.7%* (n=31)	*17.6%* (n=23)	*28.2%* (n=37)	*29.0%* (n=38)
S4	*For business property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings…….....	*1.5%* (n=2)	*20.5%* (n=27)	*18.9%* (n=25)	*28.8%* (n=38)	*30.3%* (n=40)
*S5**	Relative to the current property tax system, *single-family residential property owners* would prefer a system that taxed land at a higher rate than buildings…….	*0%* (n=0)	*5.3%* (n=7)	*25.8%* (n=34)	*30.3%* (n=40)	*38.6%* (n=51)
S6	Relative to the current property tax system, *business property owners* would prefer a system that taxed land at a higher rate than buildings…….....	*1.5%* (n=2)	*6.8%* (n=9)	*24.2%* (n=32)	*29.6%* (n=39)	*37.9%* (n=50)
S7	A system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system……	*0.8%* (n=1)	*2.3%* (n=3)	*15.2%* (n=20)	*25.0%* (n=33)	*56.8%* (n=75)

TABLE 6.6
Survey Results on Administrative Feasibility, by Familiarity with Land Value Taxation[1]

Statement		*Not Familiar* *(n=94)*	*Somewhat Familiar* *(n=26)*	*Very Familiar* *(n=11)*
S1	*For single-family residential property*, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…..…….....	4.30 (1.02)	4.42 (0.86)	3.82 (1.08)
S2	*For business property*, it would be easier to generate a defensible market value for only the land versus generating a defensible market value for the total property…….....	4.15 (1.00)	4.15 (1.05)	3.64 (1.21)
S3	*For single-family residential property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings…….....	3.65 (1.19)	3.40 (1.12)	3.73 (1.27)
S4	*For business property*, the current assessed values for land would be good estimates of land market value if the state switched to a property tax system that taxes land at a higher rate than buildings…….....	3.68 (1.16)	3.54 (1.17)	3.91 (1.14)
*S5**	Relative to the current property tax system, *single-family residential property owners* would prefer a system that taxed land at a higher rate than buildings…….	3.94 (0.95)	4.38 (0.80)	4.00 (0.89)
S6	Relative to the current property tax system, *business property owners* would prefer a system that taxed land at a higher rate than buildings…….....	3.91 (0.97)	4.04 (1.25)	4.00 (0.89)
S7	A system that taxed land at a higher rate than buildings would be easier to administer than the current property tax system……	4.38 (0.87)	4.31 (0.93)	4.09 (0.83)

* For Statement 5, response values across groups are significantly different at $p<0.10$ using a non-parametric test. For all other statements, response values are not significantly different across groups at conventional levels.

[1] The values represent the mean and (standard deviation). One survey respondent did not indicate his/her familiarity with LVT.

TABLE 6.7
Spearman Correlations between Statement Responses and Appraisal District Characteristics (n=130)

	Log Value	% single-family residential	% vacant land
% single-family residential	0.517***		
% vacant land	-0.718***	-0.147*	
Statement 1	0.047	0.051	0.107
Statement 2	0.087	0.091	0.055
Statement 3	-0.162*	-0.047	0.165*
Statement 4	-0.204**	-0.147*	0.131
Statement 5	0.063	0.029	-0.055
Statement 6	0.073	0.062	-0.013
Statement 7	0.017	-0.026	0.140

***, **, and * indicates significance at 1%, 5%, and 10%, respectively, using a two-tailed test.