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to the Property Tax**

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Measuring Behavioral Responses to the Property Tax¹

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1. Introduction

Property taxes potentially affect a wide range of decisions by altering the relative prices that influence choices such as whether to own or improve property, where to locate housing and capital, as well as where to live and in what size of dwelling, both of which can influence urban sprawl. Understanding these effects goes well beyond the simple questions of whether a property tax is imposed and at what rates. Relative prices are also affected by many other elements of the property tax structure including administrative techniques, incentives that are offered, breadth of the property tax base, limitations on property values, differential assessment by class of property and other factors. Whether or not these effects were understood when the various policies were implemented or when the property tax was structured is irrelevant – behavioral responses can result regardless of whether they were anticipated.

This paper focuses on excise effects of the property tax system. The excise effects are, of course, only one element in determining the role that property taxes should play as a revenue source and tell us only part of the story on the tax's ability to generate revenues, the incidence of the tax and other concerns. In addition to direct excise tax effects, such as on land use and city structure, the tax can indirectly affect choices such as between private and public schools. Some of these effects may be desired, at least in certain circumstances, such as if the property tax limits sprawl or if the property tax improves land use. Others may be undesirable, such as if the property tax creates disincentives to improve property. Generally, we seek to understand the effects of the property tax without asking the question of whether the effects are inefficient distortions,

whether they are helping to correct for externalities, or whether the tax serves as a benefit tax.

This paper summarizes our empirical understanding of the behavioral effects of the property tax. It is not possible to address the broad range of effects within a single paper and we selectively examine a set of possible impacts to evidence some general findings on the responsiveness of behavior to tax changes.

Unexpectedly, little empirical research has been undertaken on many potential property tax effects in recent years. One would expect more research since the property tax was responsible for 72.4 percent of local government tax revenue in fiscal year 2004/05 and generated \$73 billion more revenue than the sales tax, the second largest state and local tax. Further, the tax has the longest history among the major taxes currently employed in U.S. government finance. Empirical research on the property tax seemed much more common several decades ago, and much of the attention seems to have shifted to the federal individual income tax and corporate income taxes. Theoretical work and policy discussion on the property tax seems to be continuing at a steadier pace than careful empirical work. A paucity of research often arises because data that directly relate to particular choices are very difficult to obtain, and that may be the case with the property tax. And, the data that do exist are inconsistent across states. Another possible explanation is that much of today's empirical work relies on micro data, which are less likely to be used for studying the property tax than aggregate data (though Anderson, 2008, is an exception). Researchers are likely to find it very difficult to obtain cross state (or even intrastate) micro level property tax data without considerable effort.

Not surprisingly, there are few if any recent counterparts in empirical property tax research to the taxable income elasticity literature that seeks to account for all effects within a single measure, at least in the sense that analysts have interpreted their work in this fashion.² This omission makes it impossible to measure the overall extent of how the property tax influences choices. Data issues and lack of focus probably explain this omission.

The empirical research on the excise effects of the property tax generally finds that the property tax matters, whether the focus is on household and business location, urban sprawl, or household improvements. Some types of effects appear relatively large, and others are modest. Tax effects are smaller in other cases, such as interregional business location decisions. The extent of behavioral effects appears to work inversely with geographic size. For example, behavior is more responsive within metropolitan areas, where many other factors that might influence the decisions are held constant, than across regions. Business locations within metropolitan areas are very responsive to property tax differentials and the effects on homeowner tenure can be large. Land use decisions are quite responsive to taxes along the urban fringe.

The ways in which governments structure property taxes, as well as their rates influence behavior. One example is that relative limitations on assessed values, whether through tax/expenditure limits or through current use assessments, are found to create large impacts. The very visible nature of property tax liabilities, versus less transparent taxes such as the sales tax, may be reason. Taxpayers appear to be keenly aware of how the property tax structure affects them (i.e., their effective rate), and respond accordingly.

² See Giertz (2007) for a recent summary of the taxable income elasticity literature. Ladd and Bradbury (1988) can be interpreted as a broad elasticity, though it was not generally thought of in those terms when it was written. Their study may not address some consequences of the tax, such as ownership decisions.

However, the focus of considerable research on non-traditional components of the property tax, such as tax/expenditure limits, means the results often cannot be easily applied to general property tax questions.

The property tax has no excise tax effects to the extent that it is capitalized into land or another fixed factor. This paper does not examine the extant literature that has developed on capitalization, but readers should see papers such as Zodrow (2001) for a full discussion of capitalization. Having said this, full capitalization in the traditional sense cannot occur for many of the unique aspects of the property tax considered in this paper, such as tax and expenditure limits.

The spending of property tax revenue is given relatively little attention in some of the literature, perhaps suggesting omitted variable bias may exist. The bias is likely downwards, suggesting research finds greater distortions from the tax than actually occur, because of failure to consider the positive implications of obtaining additional public services.³ Again, omission of expenditures may be less important in some research, such as tax and expenditure limits, where the revenue effects may be relatively smaller (since the tax base often reverts to market value when property changes hands). But revenue consequences exist even in these cases. Lang and Jian (2004) discuss the theoretical/empirical difficulties of separately identifying revenue and expenditure effects, but also examine effects of tax rates versus tax revenues on property values after introduction of Proposition 2 ½ in Massachusetts. They find that property values rose in jurisdictions that were able to increase tax revenues most rapidly when confronted with Proposition 2 ½. Their explanation is that service levels may be below equilibrium and

³ Research on location effects for industry is an exception, such as Helms (1985), where many studies include consideration of the spending side.

higher taxes allow the desired greater expenditures illustrating the potential importance of considering the revenue/expenditure consequences when examining the excise tax effects of the property tax.

This paper is divided into six primary sections - each drawn from an area where the property tax is expected to affect behavior – plus a conclusion. The first section after this introduction focuses on effects on household mobility. Section three focuses on business location within a metropolitan area. Section four addresses effects on property improvements, new home construction, and housing abandonment. Section five examines impacts on urban sprawl. Section six considers the effects of the property tax on agricultural versus urban land use. Section seven considers the impacts of property taxation on housing price volatility and section eight offers concluding remarks.

2. Property Taxes and Household Mobility

Two types of studies have implications for how property taxes affect household mobility. The first is research directly examining how fiscal variables influence decisions to move. The second is research that addresses mobility effects of tax and expenditure limitations. Each is considered here. The overall finding is that property taxes have some effect on decisions of whether or where to move, though not all research concludes that the tax alters decisions. Unfortunately, the research is not structured in a way that allows precise elasticity calculations. Also, none of the research directly addresses whether property tax differentials, presumably adjusted for public service expenditures, cause households to move within a metropolitan area.

Effects on Decisions to Move

Very little research has directly examined the effects of property taxes and fiscal variables on household mobility within and across housing markets. Fox, Herzog and Schlottman (1989) are an exception as they use microdata for movers between 1975 and 1980 to study the effects of fiscal variables on the propensity of people within a MSA to make a decision to move, to move outside of a MSA and to move into a MSA. They find that fiscal variables generally have a smaller influence on the decision to move from a small part of a MSA than on decisions to move out of or into a MSA. Further, fiscal variables have a greater effect on decisions to move *from* a MSA than to move *to* one. This is likely because people have more information about the fiscal variables in the places where they live than in the places to which they are moving.

The property tax encourages outmigration from a MSA, but has no effect on the other migration choices for the broad group of movers. However, they divided their sample of movers into higher and lower income and found that high property taxes retard the movement of higher income people. This suggests that higher income people have a preference for property taxes compared with other revenue sources. One possible explanation is that there is a tendency to underassess higher valued homes relative to other property.

Knapp, White and Clark (2001) improve on Fox, Herzog, and Schlottman by estimating a nested logit model for household mobility. The model permits migrants to consider spatial options by comparing an origin location with either a small set of alternatives within the origin MSA or a broad set of options (locations in a suburban or center city location) in another MSA. The characteristics of potential migrants do not

vary across these choices but the attributes of alternative locations do. The 1990 Public Use Microdata Samples are used to estimate the model that includes per capita county property tax revenue as an attribute. Property taxes have a smaller effect than police expenditures, weather and employment growth on intraMSA decisions, but are more important than a number of factors. Low property taxes are found to have a greater effect in keeping people from moving than in attracting people to particular locations within the origin MSA. Similarly, lower property taxes have a greater holding effect in the origin MSA than attracting effects to the destination MSA, a similar result to Fox, Herzog and Schlottman. Unexpectedly, they find that people tend to move to MSAs with higher property taxes. The authors suggest this may result because of correlation between the property tax and public services that people demand.

Acquisition Value versus Current Value Assessment

At least eight states limit the rate at which assessed property values can grow over time until there is an ownership change (see Sjoquist and Pandey, 2001), though the specific implementation differs widely. For example, California's much discussed Proposition 13 limits the growth in property values to 2 percent annually unless the property is resold, at which point the property is assessed at current value. Maryland limits assessed value increases to 10 percent annually, though counties are empowered to levy a tighter constraint. South Carolina allows assessments for owner occupied property to rise no more than 15 percent across any five-year period. Florida limits increases in assessed values to 3 percent annually and imposes a maximum 2 percent rate. These

limits are said to result in taxation based on acquisition values (based on market value at the time of purchase) rather than on current market value of property.⁴

Acquisition value assessments potentially have a number of implications for property taxes including horizontal and vertical equity, stability of communities, and population mobility. We focus on one of these implications – population mobility - because it provides an indirect test of the overall effects of property taxes on mobility. Mobility and the willingness to move are affected by acquisition value taxation because the real property tax falls over time with the rate of housing inflation unless the property is resold, which allows us to examine how households facing different effective tax rates at each point in time behave.

The results cannot be directly translated to broader policy implications for the property tax because of unique aspects of acquisition value assessments, such as the lock in effect. Further, the results do not necessarily indicate whether property taxes affect where households locate within a metropolitan area because the incentives are to hold property once it is purchased, even if the household is located in a high nominal tax rate jurisdiction. But, the finding that tax/expenditure limits reduce mobility is a finding that property taxes affect location decisions. This suggests that differential property tax rates can have implications for decisions on when and whether to move, when or whether to own a home, and where to locate. Of course, acquisition based taxes allow existing homeowners to shift relative tax burdens to new entrants to the community so the balanced budget expenditure effects are not the same as the mobility effects of imposing a property tax and spending the revenue, say on education. It should also be noted that

⁴ Taxation of some other property may not be based on current value either, such as greenbelt legislation associated with agricultural property.

acquisition tax systems often apply to commercial and industrial property as well as household property, but the empirical research focuses almost exclusively on the household effects, leaving us with no evidence from the literature on non-residential decisions.

O'Sullivan, Sexton, and Sheffrin (1995) provide evidence that acquisition taxation can affect mobility, ownership decisions, and household sorting. These decisions are interrelated as ownership decisions affect the degree of population mobility. Households are less likely to move if their property tax liabilities fall annually with owning and staying in the same home and take a discrete jump upward if one sells and moves (the lock in effect).

Ownership effects likely depend on characteristics of the household. Those households that are more likely to move frequently are encouraged to rent and those moving infrequently are more likely to own. There is no direct effect on the mobility of renters, who do not benefit by staying in their home longer because the tax effects depend on duration that rental property is held by the owner, not by the user. There may be an indirect effect to the extent that renters pay relatively more or relatively less of the tax burden for a given level of services, and may choose communities where they pay the least for the services that they receive. Further, there is a tendency for households to sort according to frequency of move, with frequent movers preferring jurisdictions that do not have acquisition valuation systems (presuming both types of jurisdictions are available within a housing market) because this avoids a relative shift of the property tax towards movers. These effects on behavior generate excess burdens. For example, using a simulation model, O'Sullivan, Sexton, and Sheffrin demonstrate that movement to a

Proposition 13 style acquisition value tax causes an excess burden equal to 4.58 percent of tax revenue or 0.41 percent of income.

Several authors have investigated the lock-in effect of an acquisition structure. Wasi and White (2005) extend O'Sullivan, Sexton, and Sheffrin's reasoning to observe that the incentive to become a homeowner that is created by acquisition value taxes is diminished in a more general equilibrium setting because the value of owner occupied housing rises with the increased demand as households seek to move from renting to owning. The corresponding decrease in the cost of renting relative to owning tends to extend the duration before renters choose to become homeowners. Wasi and White estimate a treatment effects model using data for 1980, 1990 and 2000 for households in California, Florida and Texas. Average tenure for California owner-occupiers was approximately the same in 1970 (before Proposition 13) as for households in the other states, but California tenure was much greater by 2000 (13.43 years versus 11.65 years in one set of models). They find that effects differ according to the demographic characteristics of the households. For example, African-American households and migrants to California from other states responded more to Proposition 13 than did others. Further, the effects are growing over time.

Acquisition value taxes create an implicit subsidy for homeowners, the size of which rises with income (and duration of homeownership). As a result the effects on mobility become greater as income rises. For example, the length of tenure in California rose from 10.2 to 16.8 years for the highest income quartile while the mean tenure fell in the lowest income quartile between 1980 and 2000. Though arising for a different reason, this supports the Fox, Herzog and Schlottman conclusion that higher income households

prefer high property taxes. The size of the subsidy also differs across regions of California since the subsidy depends on the pace at which housing values rise, and this had the expected effect of increasing tenure more in areas with higher housing price growth.

Additional research on Proposition 13 and other tax/expenditure limitations has yielded mixed results. Stohs, Childs, and Stevenson (2001) sought to examine the longer-term effects on mobility by studying sales of households in census tracts in California, Illinois and Massachusetts from 1990 to 2000. Mobility is found to be significantly lower in California using both analysis of means and regression techniques. But no effect was found in two other studies. Nagy (1997) examined the short run effects immediately before and after Proposition 13 was introduced by comparing mobility in three California SMSAs and seven non-California SMSAs. Mobility was generally lower after Proposition 13 than before, but this was true for both the California and other SMSAs so this failed to evidence that Proposition 13 altered behavior. Sjoquist and Pandey (2001) investigate the effects of a property tax freeze in Muscogee County Georgia on the probability of moving and find no relationship.

3. Property Taxes and Business Location

This section examines effects of the property tax on business location decisions. Empirical work on taxes and business location has received much greater attention than other effects of property taxes on behavior. Wasylenko (1997) provided a comprehensive review of this literature, and the following discussion draws heavily from his findings

while adding a few more recent studies.⁵ The business location literature can be conveniently divided into effects across broad geographic areas (usually interstate) and effects within a single metropolitan area, which may be thought of as within a single labor market.⁶

The literature is generally focused on estimating the effects of the property tax, other taxes, and expenditures on economic activity. Profit or cost functions underlie most of the research, but the actual specification is often rather ad hoc in nature. The dependent variable in these equations (some measure of development) has been variously measured using employment, business investment, firm births and other proxies, frequently with a focus on manufacturing. Then, an equation is estimated using input costs, domestic demand, operating environment (such as agglomeration economies, right to work laws, etc.), and fiscal measures as regressors. Net returns to capital are normally excluded under the assumption that capital will adjust across regions until they are equal. Thus, gross returns to capital are presumed to differ based on taxes. Fiscal variables include measures of public expenditures or services in addition to taxes.

Wasylenko identifies 34 articles that estimate cross-region business tax elasticities, where business taxes include either property tax, corporate income tax, or both. Tax liabilities are measured in a variety of ways within the studies. Taxes are often measured with the nominal tax rate, per capita taxes, or taxes as a percent of personal income. Some studies rely on marginal after-tax rates of return or marginal business tax rates.

⁵ Also, see Bartik (1991).

⁶ There is also a literature on international effects, which is less relevant to property tax discussions. Much of the recent research on effects of business taxes on location has examined cross country investment and particularly foreign direct investment. See de Mooij and Ederveen (2005).

Twenty-eight of these cross-region studies examine manufacturing, measured by individual firm locations, employment or investment. The orientation to manufacturing is generally based on the expectation that manufacturing sells to a broader output market so that firms are freer to consider a range of locational choices. Taxes are presumed to have a greater effect on decisions where location near the output market is less important. However, such a strong focus on manufacturing may have less relevance today than in the 1970s and 1980s, the time span for much previous work, since manufacturing represented 18.3 percent of total U.S. employment in 1985 and 10.0 percent in 2007.

Twenty-four of the 34 interregional studies find that business taxes have a statistically significant effect on location decisions though the elasticities are generally very small, with median values lying somewhere between 0 and -0.26 . Research based on micro data generally finds smaller elasticities than those drawn from more aggregated data.⁷ A key finding is that the estimated elasticities are very unstable, but not because of the type of data used or the way that the taxes are measured. Instead, Wasylenko concludes that the time period analyzed explains some of the variability in conclusions. He also argues that states have reduced the differences in tax structures to the point that the differentials are often too small to affect location decisions, so that more recent studies are less likely to find that taxes have locational effects. The latter conclusion runs counter to the finding of Bruce, Deskins, and Fox (2007) who conclude that the role of taxes is growing. The latter study, however, is based on corporate taxes and not the property tax.

⁷ The micro studies are based on individual firm location data, but often without firm level data on tax structures.

Wasylenko examines 11 studies of intraregional effects of business taxes, of which 9 find a significant effect. These studies are much more likely to have focused on the property tax. The general expectation is that taxes will have a greater effect within a metropolitan area because other factors affecting location, such as labor force, transportation, and infrastructure, are more likely to be neutralized leaving tax differentials as a potentially important consideration. Wasylenko concludes that intrametropolitan elasticities are at least four times larger than interregional effects. The result may also signal that locational decisions are more responsive to the property tax than to the corporate income tax, which is not surprising given the likelihood that property taxes are significantly more important as a share of business costs.

4. Property Taxation and Property Improvements, New Home Construction, and Residential Housing Abandonment

Next we consider the extent to which the property tax affects improvements to property. Improvements generally can be thought of as those arising from movement of new activity to a jurisdiction because of differential tax rates, such as when property taxes influence the location of business or households, and those arising from improvements on existing property. The first two sections addressed locational effects, and this section considers improvements besides locational impacts.

It has generally been held that a traditional property tax, imposed on both improvements and land, reduces improvements as it taxes both the mobile capital (improvements) and immobile land. Theoretical literature indicates that taxation of improvements and land reduces the extent of improvements, and so not unexpectedly,

movement towards site value taxation expands the amount of improvements. Brueckner (1986) theoretically examines the results of imposing a broad property tax across a metropolitan area versus those that might result from differential taxation within a market. He demonstrates that movement towards a site value tax (tax gradation) by a small jurisdiction raises the relative level of improvements and the price of land as it lowers the relative taxation of mobile activity.⁸ The extent of improvements rises even with movement to gradation across an entire housing market, but in this latter case the price of land falls if housing demand is price inelastic.

The empirical literature is sparse on the degree to which the property tax affects improvements likely because of the difficulty of empirically separating the effects on improvements from the effects on locational choices, at least in part because data generally do not separate the two types of changes in property values. The traditional property tax is imposed at the same rate on the site value of land and on any improvements so that the tax on improvements is very difficult to disentangle from the cross jurisdictional effects. Two studies have been undertaken, one focused on residential property and one with results primarily focused on commercial property. Each relies on elements of property tax structures in a few places that might have differential effects.

Oates and Schwab (1997) use data from Pittsburgh and 14 other cities to investigate effects on improvements, but recognize that the data available for their analysis are less than perfect, particularly since they are based on a single event. Land in Pittsburgh was taxed at twice the rate of improvements until 1979 and since has been taxed at approximately five times the rate, though the differential applies only to the city

⁸ Some arguments have been made regarding why site value taxation may also impose disincentive effects (see Oates and Schwab, 1997).

tax and not the county and school district taxes. The analysis is complicated by the city's propensity to grant tax abatements for new investments.

The Oates and Schwab research supports the finding that a traditional property tax discourages improvements, though the study is unable to quantify the effects precisely. Pittsburgh is one of the two cities where the annual value of building permits was higher during the 1980s than in the 1960s and 1970s, and the value was more than 70 percent higher in Pittsburgh. The finding is reinforced by Census data showing a dramatically higher increase in Pittsburgh than in the other cities. Further, the building boom was primarily in the commercial sector and not in the residential sector, which would be consistent with commercial property being more mobile than residential property. Oates and Schwab do not assert that land value taxation encourages development, of course, but instead that the tax eliminates the disincentive that arises from traditional property taxation. Unfortunately, the increase was only in the City of Pittsburgh and not the MSA, so the Oates and Schwab results may mix the locational effects of tax differences inside the Pittsburgh metro area with effects of eliminating the disincentive to improve property.⁹

It should be noted that there is an alternate theoretical literature that challenges the basic intuition behind the long held belief behind the neutrality of land value taxation; several studies have shown that this neutrality may not necessarily be the case. Bentick (1979) and Mills (1981) developed this reasoning by designing a model that considers the timing of development for unused parcels of land when a land value tax is levied on the

⁹ Also see England (2003) who uses a simulation model to predict that a revenue-neutral shift from a traditional property tax to a pure land value tax in New Hampshire would likely have a positive impact on economic activity in the state. See Bowman and Bell (2004) who study the initial distributional impacts of a shift to split-rate property taxation in three Virginia localities.

market value of land, rather than on current income from the land. Bentick finds that a shift from a traditional property tax to a tax on land value can favor capital investments that yield relatively quick returns and may, correspondingly, hasten the speed at which unused parcels of land are developed.¹⁰ However, this result holds only in the case in which land is assessed for tax purposes based on its current income stream rather than at its actual market value.¹¹ Despite this possibility of accelerated construction as a result of land value taxation, Oates and Schwab argue that this issue is of minor importance in the particular case they analyze because the land value tax was not levied purely on the actual market value of land, but instead was levied in something of a hybrid fashion – a levy that blends market value and the current income stream from a parcel of land. No studies have been identified that empirically test this specific body of theory.

Next we consider Anderson (2008), who provides an empirical analysis of the effect of property tax exemptions on the decision to maintain or make improvements to the existing residential housing capital stock. Anderson focuses on the This Old House program in Minnesota, which ran from 1994 through 2004 and exempted at least half of the value of improvements to residential homes from property taxation for 10 years. Anderson is able to exploit variation in property tax levies since the program only applied to homes that were at least 35 years old for improvements that began before July 1, 1999 (or homes that were at least 45 years old for improvements that began after that date), asserting that homes and homeowners were likely similar in nature for housing that was close to this cutoff point. Based on data from one county in Minnesota, Anderson's results indicate that the property tax does exhibit a significant effect on improvements to

¹⁰ See also Bentick and Pogue (1988).

¹¹ See also Wildasin (1982) and Tideman (1982).

existing residential capital. More specifically, Anderson finds that “a 50 percent decrease in the tax costs of new construction is associated with a 9 percent increase in the number of homes undergoing new construction” (Anderson, 2008, pg. 371), translating to an elasticity of 0.18. However, he finds reasons to question the results since fewer than 50 percent of the eligible households take advantage of the exemption and some robustness tests fail to support the finding.

Turning our focus from property improvements specifically, next we consider White (1986), who investigates the effect of property taxes on the decision to abandon existing housing using data from New York City for the years 1976 and 1978 for 260 neighborhoods in the city. She models the probability of property abandonment as a function of property tax liability. Her results indicate that the property tax has a strong effect on the probability of abandonment in a neighborhood. In particular, she reports a seemingly large elasticity of 2.1 of abandonment rates with respect to property tax liability in the immediate term. Further, she reports that the lagged effect over a two-year period declines slightly to 1.65. White illustrates the size of the effect that she finds as follows:

...suppose that the average building in the sample had its assessed value reduced by \$1000, from \$30,300 to \$29,300. This change would reduce average property tax liability by 3.3% and would cause the probability of abandonment to fall by about 7% in 1976, or from a rate of 6.2% to a rate of 5.8%. (White, 1986, pg. 326-327).

In a related work, McGibany (1991) provides an empirical analysis of the effect of property taxation on new home construction, using a panel of county-level data from

Wisconsin for the years 1978-1989. McGibany first estimates the effect of effective county property tax rates on single-family housing starts and finds an elasticity of -0.61. The author presents this first specification as a test of the “old view” of property taxation which views the property tax as an excise tax on the consumers of housing capital, taking a partial-equilibrium view and assuming that the supply of housing capital in a particular region is perfectly elastic. McGibany goes on to estimate a model of housing starts in which he separates one’s own property tax rate from the average property tax rate in the local area. This specification, he argues, is more akin to a test of the “new view” of property taxation in which the average rate of property taxation in an economy fall mainly upon the owners of capital, but further, local deviations from the average national rate of property taxation act in accordance with the “old view”, as an excise tax on the consumers of housing capital. In this model, McGibany estimates an elasticity on the user cost of capital variable, which incorporates the actual property tax rate, of -1.47, and he estimates an elasticity on the average property tax in a region of -0.95.

5. Property Taxation and Urban Sprawl

Song and Zenou (2006) provide an empirical investigation of the possibility that property taxation has contributed to urban sprawl. Song and Zenou base their empirical analysis primarily on Brueckner and Kim’s (2003) theoretical work on urban sprawl and the property tax. Brueckner and Kim pose two effects of property taxes on urban development: The first, termed the improvement effect, reasons that property taxation would promote urban sprawl because it depresses the level of housing capital improvements per acre, resulting in a less intensive use of land and a lower population

density in a city. The second effect, termed the dwelling size effect, would instead lead to a reduction in urban sprawl because, if the incidence of the property tax is partially shifted to consumers, the tax would lead to a reduction in the size of a home, resulting in a more densely populated city.

Song and Zenou first modify the Brueckner and Kim theoretical model and show, using a different type of utility function in specifying preferences over housing and other goods, that the property tax unambiguously reduces urban sprawl (i.e., the dwelling size effect is dominant). In their empirical test of this model, Song and Zenou use a sample of 448 urbanized areas (with a population of at least 50,000) in the U.S. They gather data for the effective tax rate in each taxing jurisdiction, and then form an effective tax rate for an entire urban area using a weighted average of the effective tax rates in each part of the area. Song and Zenou use a two-stage-least-squares model that controls for the endogeneity of urban sprawl and the effective property tax rate, since policymakers may raise property tax rates in cities with more urban sprawl to cover the higher costs of providing infrastructure in a less densely populated area. Results of the Song and Zenou analysis indeed indicate that higher effective property tax rates reduce the spatial extent of an urban area, estimating an elasticity of around 0.4, i.e., a one-percent increase in the effective property tax rate leads to a reduction of approximately 0.4 percent in the spatial extent of an urban area.

Marshall (2008) studies the effect of property taxes on urban sprawl in 306 MSAs in 1990 and 2000. A Gini sprawl measure is the dependent variable in an instrumental variables regression framework using average property tax rate in the MSA and a number of other factors as regressors. Consistent with Song and Zenou, higher average property

tax rates are found to result in less sprawl, indicating that the dwelling size effect exceeds the improvement effect. She also finds that higher variation in property tax rates results in greater sprawl, perhaps suggesting that residents move from high tax to low tax jurisdictions within the MSA.

6. Property Taxation and Land Use

Now we turn our attention to the literature relating to the property tax and land use. While there is a sizeable theoretical literature in this area (see Anderson (1993), for example), only one study has been identified that provides an empirical analysis of how the property tax affects land use. In particular, Morris (1998) examines the effect of preferential property tax treatment of farmland on the conversion of farmland to urban development. The preferential property taxation in this case comes in the form of use value assessment (rather than market value) in which a property is assessed for property tax purposes based on the income it currently produces, rather than its market value. While this type of assessment may not always result in significant differentials in property assessments, it is relevant on the urban fringe where agricultural land is being converted to urban uses, in which case the assessment method reduces the effective property tax rate for farmland. Morris uses county-level data from nearly 3,000 U.S. counties from every fifth year from 1959 through 1987. Morris specifies the explanatory variable in her baseline empirical model as a dummy denoting whether a county allows for land-use assessment for property taxation, rather than market value assessment. Variation in this variable follows from the fact that states adopted land-use valuation at

different years starting in 1957 through 1986 (at which point every state adopted the practice).

Morris designs an empirical model of the ratio of farmland in a county relative to total land as a function of how long land-use valuation has been practiced in the county. Results from Morris' baseline analysis indeed indicate that practice land-use valuation increases the proportion of farmland in a county, and the result is robust to three functional forms. More specifically, Morris finds that "After 20 years or so, we see about 10 percentage points more land in farming associated with the policy... (Morris, 1998, pg. 150). Morris goes on to a more specific model in which she considers not only whether land-value taxation is practiced, but also whether cumulative forgiven property taxes are collected when a parcel of land is finally converted to urban use. Morris finds that counties that require deferred property taxes when land is converted to urban use also experience an increase in the proportion of farmland, but, as expected, the additional farmland in those counties is not as high as in those counties where property taxes are forgiven completely, rather than simply deferred. These general conclusions hold in a parsimonious model with only the property tax assessment as an explanatory model or whether other control variables (population density, market value of farmland and buildings, total property taxes per capita, and value of farm sales) are included.

7. Property Taxation and Real Estate Speculation

While we do not address the voluminous literature on the effect of the property tax on real estate prices in the long run, as previously discussed, we do note one paper that considers the effect of property taxes on real estate speculation. Case (1992) does

examine the effects of property taxes on land prices, but his analysis is fundamentally different from the larger literature on how the property tax affects land prices because of its focus on short-run volatility, and in particular speculative bubbles, in housing prices rather than long-run equilibrium effects. Case analyzes data from New England, focusing on significant variation in effective property tax rates in Massachusetts's towns between 1982 and 1990. Case's key contribution is through the estimation of a series of regression models of the percent change in housing prices between 1982 and 1990, as a function of effective tax rates and other control variables. Case identifies no statistical significance on effective tax rates in these equations. Overall, Case concludes that "...land holding taxes do not seem to have much of an effect, at least at current rates in Massachusetts, on upside volatility." (Case, 1992, pg. 236).

8. Concluding Remarks

Through this review we have described a great deal of evidence indicating that property taxation affects individual and firm behavior in many important ways. Beginning with effects of the property tax on household mobility, we reviewed evidence that higher property taxes in general significantly increase outmigration from an area, but lower property taxes do not attract immigration. We found evidence that property tax limitations exert noteworthy (and likely inefficient) distortions on household tenure and sorting decisions. In the second section we reviewed evidence that state and local taxes, including property taxes, tend to have statistically significant, but small effects on the interregional movement of economic activity, but that effects tend to be much larger in with regards to movement within a region. Further, we reviewed evidence that the

property tax affects decisions to improve existing property, although here the evidence is relatively limited due to a lack of desirable data. On a related note, we reported evidence that the property tax can have important effects on housing starts and housing abandonment. We discussed some evidence that the property tax significantly reduces urban sprawl and we found that preferential treatment of land in agricultural use significantly reduces urban development. Last, we found that property taxation does not significantly reduce real estate price volatility.

Overall, this review has shown that property taxation will generate significant behavioral effects that should be taken into account by policymakers. However, the evidence that we find often tends to be older and is often specific to a particular region of the U.S. More research is needed to provide full information for policymakers to understand each of these behavioral effects on a broad scale and to understand current distortions (as evidence has shown that the distortions of other elements of state tax policy may be changing over time (Bruce, Deskins, and Fox (2008))). Overall, we would urge research to renew the considerable interest in the property tax that has existed in the past. We would especially advocate for more research on the potentially significant ways in which the property tax can actually engineer desired activities such as when it can reduce urban sprawl and when preferential property tax treatment of farmland can protect farmland.

Beyond this, the greatest need as we see it is for more research to estimate the overall efficiency consequences of property taxation in order to determine the most efficient application of the various state and local taxes. The existing research has addressed many of the various distortions of property taxation individually. However,

there has not been an analysis of the elasticity of the taxable property tax base with respect to changes in the property tax rate. As stated above, this approach would have the advantage of providing the broad, comprehensive analysis of the overall distortions of the property tax that is needed. However, we recognize that such an analysis would have to overcome daunting data limitations in that it would be challenging to measure the property tax base for a given taxing jurisdiction and also the effective property tax rate in the jurisdiction.

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