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Who Supports Portable Assessment Caps?: The Role of Lock-Ins, Tax Share, and Mobility

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Abstract: We examine voter support in 2008 for Constitutional Amendment 1 in Florida, which modifies a Proposition 13–like property assessment growth cap by allowing homeowners to port their exempted value to a new home. Despite claims by amendment proponents that it would lower property taxes, we do not find that support was higher in precincts with a greater share of eligible property owners. Nor was support explained by the average size of existing exemptions. Instead, we find that precincts with more mobile households supported Amendment 1. In addition, we find evidence that voters understood how changing assessment methodology could affect their tax share. Under a conventional assessment cap, a homeowner who moves resets the assessed value to the market price, lowering the share of assessed value for remaining homeowners. Remarkably, we find that support for Amendment 1 falls as mobility in other parts of the city increases. This finding suggests that Amendment 1 was viewed as a way for high-mobility voters to shift the tax burden back to low-mobility homeowners. In addition, support is higher when a city has a high number of out-of-state immigrants, who have no tax exemption to port into the city, but support is lower when the city has high rates of in-state immigration. These findings suggest that voters are fairly tax savvy and as concerned with shifting the tax burden as they are with curbing absolute expenditures.

JEL classification: H71, R23

Key words: property tax, voting, assessment cap, lock-in, mobility, local public finance, political economy

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Please address questions regarding content to Ron Cheung (corresponding author), Department of Economics, Oberlin College, 233 Rice Hall, 10 N. Professor Street, Oberlin, OH 44074, 440-775-8971, 440-775-6978 (fax), rcheung@oberlin.edu, or Chris Cunningham, Research Department, Federal Reserve Bank of Atlanta, 1000 Peachtree Street, N.E., Atlanta, GA 30309-4470, 404-498-8977, chris.cunningham@atl.frb.org.

1. Introduction

Since the property tax revolts began with California voters' approval of Proposition 13 in 1978, fifteen states have curbed the growth in property assessments, and most other states have limited millage rates or the growth in property tax revenue. When these restrictions are enacted, they can significantly reduce local expenditures and revenues (Downes, 1992; Figlio, 1997). However, the question of why voters restrict the power of their local governments through limitations is contentious. Voters may support them because they believe they will improve local government efficiency rather than reduce public services (Citrin, 1979; Ladd and Wilson, 1982). Doyle (1994) and Figlio and Rueben (2001), however, provide evidence that these expectations are often not realized. Buttressing this, Cutler, Elmendorf and Zeckhauer (1999) find that voters' estimation of government efficiency is inversely correlated with their personal tax liabilities, while Fischel (1989) posits that Proposition 13 was a rational response to a recent court decision (*Serrano v. Priest*) that equalized school expenditures. A related puzzle is why voters use state referenda to constrain a revenue source that is primarily utilized by local government. One explanation is that an agency failure of local officials makes them difficult to monitor. For instance, Anderson and Pape (2008) suggest that current voters do not trust future voters to guard their interests and thus seek laws that raise the necessary vote-share for future tax increases.

However, many states with assessment caps do not simultaneously constrain millage rates or have maximum rates that are not binding, making the intent of voters less clear (Hoyt *et al*, 2009). Complicating this is that whether or not they lower expenditures, assessment caps encourage households to over-stay in their current home (Bogart, 1990; Stohs, Childs and Stevenson, 2001; Wasi and White, 2005; Ferreira, 2007.)[1] If housing match quality diminishes over time then this "lock-in" effect from assessment caps may generate an aggregate welfare loss (O'Sullivan, Sexton, and Sheffrin, 1995; 1999) and could induce additional construction at the urban fringe (Wassmer, 2008.)

[1] Nagy (1997) does not find an effect on mobility.

The existing literature can be informed by the recent passage of a novel constitutional amendment in Florida. Amendment 1, approved in 2008, modifies Save Our Homes (SOH), the state's existing assessment cap enacted in 1995, by allowing homeowners to port their current property exemption to a new home in the state.[2] By treating newly purchased homes similar to previous homes, the law ameliorates the lock-in effect but at the expense of administrative complexity, greater horizontal inequity between recent and longtime homeowners and a faster erosion of the property digest. While the original assessment cap passed with popular support, there was even greater support for the mobility enhancing amendment. This suggests that the appeal of assessment caps does not rest on an explicit desire by voters to reward more permanent households.

The portability provision is unusual because it impacts not only a household's current and future property tax liability and thus the finances of its current town, but also the assessed value of any town the household may move to in the future. Formerly, cities were able to rely on a certain amount of turnover in the market to reset assessed prices back to market prices; now assessed values will only be restored when a first-time homebuyer makes a purchase. In addition, in-state migrants from other parts of Florida can erode the local tax base faster if they port large exemptions into districts that have not experienced much appreciation. Finally, after the Amendment, local governments must reduce their expenditures, raise other taxes or fees, tax non-protected property, or raise the millage rate, which was almost never constrained. Rational voters thus had to balance their potential tax savings after a move against potentially higher immediate taxes or fewer public goods.

To explain support for Amendment 1, we combine statewide assessor property records with precinct level election data and 2000 census block group data. We predict the share of yes votes based on the mobility rate and the existing tax savings (the "tax

[2] Ferreira (2007) examines an amendment to California's Proposition 13 that permitted counties to port the exemptions of residents 55 and over. Counties had a choice whether to allow the portability or not. Oregon has a system in place where the assessment cap is transferrable to new owner, but it is not portable.

wedge") from Save Our Homes controlling for average demographic characteristics, mean income and partisanship. Despite Amendment 1 supporters' claims that it would result in a tax reduction for Floridians, we do not find higher support for the measure in precincts with a greater share of homesteaded property. Nor was support explained by the average size of a homeowner's current tax exemption, even though an existing exemption is a necessary condition for lock-in to occur. Instead, we find that precincts with more mobile households, and ones more mobile *relative* to other households in the same tax jurisdiction, were more likely to support Amendment 1. In addition, when examining inter-tax district migration, support increases when a jurisdiction has high rates of out-of-state immigration but decreases with high rates of in-state immigration. These findings are consistent with voters being cognizant of mechanics of the property tax, and they suggest that they were motivated more by an attempt to change the rules to shift the burden of financing government to low-mobility households and to new entrants to the state.

Section 2 details the original Save Our Homes exemption and the proposed Amendment 1. Section 3 lays out the theoretical framework and four hypotheses we test. Section 4 describes the econometric specification and the dataset, and we explain how we construct our independent variables of interest. Section 5 presents the results from the test of the first hypothesis, and Section 6 from the test of the second and third hypotheses. Section 7 concludes.

2. Institutional Detail

Since 1980, State law has exempted the first $25,000 of market value from assessment on a homeowner's primary residence or "homestead." In 1995, 54 percent of Florida voters approved changing the state's constitution with the "Save Our Homes" (SOH) amendment which capped yearly increases in assessed value to the lesser of three percent or the rate of inflation (based on the CPI for urban consumers).[3] Figure 1a shows

[3] In addition to the standard $25,000 homestead exemption, there is also a $500 exemption for a disabled homeowner, a $500 exemption for a widow or widower and a $5,000 exemption for a disabled veteran. Beginning in 1997, local jurisdictions can grant exemptions to senior citizens. (Section 193.155(1), F.S.)

the growing "wedge" between market and assessed values. The light bars represent the annual capped increase in property values for every year since SOH's inception. In most years, the inflation rate (based on the previous year) represents the binding cap. For comparison, the dark bars show the annualized appreciation in the FHFA house price index.[4] After a few initial years of low appreciation, many parts of Florida enjoyed extraordinary house price appreciation. For instance, house prices increased by 130 and 108 percent in Miami and Tampa, respectively, between 1995 and April 2008 (Case-Shiller repeat sales index). Figure 1b demonstrates how the assessment cap results in a long-held property having nearly half of its value untaxed. The dashed line represents the market value of a house that was bought on December 31, 1994 and that enjoys the FHFA statewide appreciation rate. The solid line represents the assessed value of this house as long as it is not bought or sold. Thanks to Save Our Homes, by 2008, the wedge (vertical distance between the two lines) represents 47% of the market value of the house and is exempt from property tax.[5]

Like Proposition 13 in California and similar measures in other states, the assessed value reset to the market price when sold, significantly increasing the property tax bill for the new owners.[6] The fear of losing the benefit of a large untaxed wedge was believed to lock families into their existing homes.[7] Yet this lack of mobility, combined with the popular perception that property taxes were still too high, created support to

[4] Formerly OFHEO.

[5] Note that for long time homesteaders, assessed value will continue to rise even as current property value declines. In a time of declining house prices, the assessed value will gradually catch up with current market value. This is mandated by the provisions of SOH.

[6] Florida is a relatively latecomer among the states in passing a statewide property tax limitation. Shadbegian (1998) points out that by 1992, half the states had passed some limitation measure. However, some of the states passed measures that did not limit annual assessment increases, which made it possible for local jurisdictions to override the limitation by inflating assessed values, while others directly capped revenue and forcing jurisdictions to reset the millage rate.

[7] Popular press cited large families that had outgrown their starter homes and retired empty-nesters who wanted to downsize, but neither group could afford to pay the additional property taxes that would come with a new house.

reform SOH.[8] On January 29, 2008, 64 percent of Floridians voted to approve Amendment 1. This constitutional amendment, which went into effect for 2008 property taxes, had four provisions: (1) the homestead exemption is doubled to $50,000 for non-school taxes; and (2) the homeowner's tax wedge is made "portable" to new homes within the state; (3) a $25,000 tangible personal property exemption is provided to businesses; and (4) assessments on non-homesteaded property, including rental properties, second homes and commercial properties, was capped at 10 percent (excluding school taxes). The $25,000 increase in the exemption adds some modest progressivity to the property tax. The business exemption on personal property was thought to be quite modest, and the 10 percent cap on non-homestead assessments does not appear to lower future tax non-homestead taxes.[9] In summary, most of the benefits of Amendment 1 were expected to be conferred to owners of homestead property. The portability provision generates roughly half of these savings and is at the center of our analysis. [10]

The universal statewide portability of the assessment wedge is unique among the states. If one buys a new home of greater value, the total value of the wedge from the past home is transferred to the new home up to a maximum portable cap of $500,000. An example may be useful. If a homeowner purchased a home in 1994 for $100,000 that by 2008 has a "just value" (assessor determined market value) of $270,000 and an assessed value of $140,000 then the wedge between market price and assessed price is $130,000. If the homeowner moves up to a home with a just value of $300,000, then without portability the assessed value of the new house is $300,000.[11] With portability, the

[8] Charlie Crist, who was elected governor of Florida in 2006, campaigned on a platform of property tax reform. Prior to the passage of Amendment 1, the governor and the legislature enacted a rollback of 2007 property taxes to 2006 levels, reducing tax revenues by $15 billion.

[9] In 2006, the statewide average millage rate was 18.47 or less than 2% of just value, Florida's Property Tax Study Interim Report, Legislative Office of Economic and Demographic Research February 15, 2007.

[10] A pre-reform analysis conducted by Florida TaxWatch projected that over 80 percent of tax relief would go to homestead property. *Briefings,* Florida TaxWatch, January 2008.

[11] Local taxes would then be levied on the assessed value less the original exemption of $25,000 available to all homesteaders. For clarity, we can ignore this in the example.

assessed value is reduced to $170,000 (300K-130K).[12] This assessed value would then rise subject to the yearly cap. Should the homeowner instead choose to buy a cheaper house, she would get to keep her old tax wedge *percentage.* For example, if the new home were worth $230,000, the new assessed value would be $110,740 (230K*(130K/270K)).

Voters confronted a difficult calculation of projected benefits and costs in deciding whether or not to support the referendum.[13] In the next section, we review how changes in the method of assessment would change the taxes of different types of voters and thus their support for Amendment 1.

3. The Property Tax under Different Assessment Policies

An individual voter's tax bill, *T*, can be expressed as:

$$T = \tau V \tag{1}$$

where τ is the jurisdiction's property tax (millage) rate, and V is the assessed value of the house. Without Save Our Homes, V is set to the market value.[14] The introduction of the original SOH legislation in 1995 capped the growth in assessed value at the lesser of inflation or 3 percent. Thus, the tax burden T was the millage rate τ, multiplied by the capped value or the market price, less the basic exemption:

$$T = \tau\left(\min(\bar{V}, V) - 25K\right). \tag{2}$$

The difference between a home's market value and assessed value is the assessment wedge, W which we define as $max(V - \bar{V}, 0)$. Prior to Amendment 1, moving to a new house resets W to zero.

[12] Note that these values were not chosen randomly but instead conform to the state average appreciation rate and caps from Table 1.

[13] Many county appraisers have found it necessary to post instructions on their websites explaining to homeowners how to calculate their portable benefits. An example is found on the Leon County Property Appraiser's website: http://www.leonpa.org/Download/Portability.pdf.

[14] Here and throughout the paper, the "jurisdiction" refers to the city if a household lives in an incorporated area and to the county if the household lives in an unincorporated area.

Amendment 1 doubles the initial homestead exemption and introduces wedge portability. If purchasing a home of greater value, the wedge is the nominal exemption on the previous home, and, if trading down, the wedge is capped at the ratio of the previous exemption to market value. Introducing subscripts, the annual property tax paid on the first home purchased after Amendment 1, T_1, depends on the accumulated wedge on the previous home, W_0.

$$T_1 = \begin{Bmatrix} \tau_1 (V_1 - W_0) - 50K) \text{ if } V_1 \geq V_0 \\ \tau_1 \left(V_1 \left(1 - \frac{W_0}{V_0} \right) \right) - 50K) \text{ if } V_1 < V_0 \end{Bmatrix} \qquad (3)$$

We can then express the consumption of all other goods, x, as a function of current income less the property tax:

$$x = y - T \,. \qquad (4)$$

The lock-in effect created by Save Our Homes can be illustrated as follows. The initial real budget set, a post-Save-Our-Homes budget set, and a post-Amendment 1 budget set, when average inflation exceeds three percent are presented in Figure 1. The household obtains utility from housing and from non-housing consumption, which are represented on the vertical and horizontal axes respectively. The $25,000 (and later, $50,000) flat homestead exemptions are suppressed for clarity. The optimal consumption level in the absence of a property tax exemption is h_0. The assessment cap generates a discontinuous budget set, B^2, where consumption of the current house affords greater non-housing consumption than other homes of similar value.[15] This differential treatment of current and future homes can generate a lock-in effect that, in the presence of depreciating housing match quality, lowers aggregate social welfare (O'Sullivan, 1999). Passage of Amendment 1 shifts the budget set back out and reduces much of the lock-in effect.[16]

[15] An alternative diagram with real house price inflation would be similar but would shift the budget set in for any housing consumption other than the current one.

[16] There is still a kink in the budget set from the differential treatment of a "trade-up" or a "trade-down."

Since the shift of the budget set is clearly related to the size of the homeowner's accumulated wedge, our first hypothesis that can be taken to the data is as follows:

Hypothesis 1. Support for Amendment 1 increases with wedge size.

However, an existing assessment wedge is a necessary, but not sufficient condition for households to experience a lock-in effect. If an owner is happy with her current residence[17], then the portability feature benefits her not at all. But in the O'Sullivan, Sexton, and Sheffrin's (1995) framework, housing mobility is driven by decaying housing match quality; households move when the current flow of housing services provides insufficient utility subject to the fixed cost of moving. They must also make some judgment as to the trajectory of future house prices. If house prices continue to fall as they had in the year before Amendment 1, then the value of the wedge to be ported will decline over time. On the other hand, if long-run house prices return to their previous trend of increasing faster than inflation, then a voter would need to consider the value of accumulated wedges in future homes. If we ignore, for the moment, existing wedge endowments and cross-metro migration, then SOH can be thought of as simply a tax on the number of moves a household makes in the future, as each move resets one's assessment to the market price and raise their lifetime property tax.

We illustrate this in Figure 3, which graphs the permanent budget set when households consume only housing mobility and after-tax consumption. Increasing the number of moves reduces lifetime consumption because each move causes the property tax rate to reset to the market price. The more frequently one moves, the less lifetime consumption of all-other-goods they can afford assuming some fixed cost of moving. The initial budget set is denoted B^1. Passage of SOH steepens the budget set, B^2, as lower mobility reduces the life-time tax burden and allows greater consumption. Passage of Amendment 1 shifts the budget set out to a new line parallel to the pre-SOH line. Thus households with a low taste for mobility (or a low rate of decay in match quality) benefit

[17] And, if bequests are to be considered, her heirs are satisfied as well.

more under a SOH regime and households with a high taste for mobility benefit from Amendment 1. This gives rise to a mobility-related hypothesis.

Hypothesis 2. Support for Amendment 1 increases with household mobility.

So far we have failed to illustrate any reason from a homeowner's budget standpoint to oppose Save Our Homes or Amendment 1. However, over time, Save Our Homes erodes a jurisdiction's digest of assessed value. Amendment 1 further erodes the base because portability allows new movers to the jurisdiction to immediately reduce their assessed value below the market value of the new home. Jurisdictions that formerly relied on household mobility to reset assessed values to market values will find their tax base shrink (or fail to grow), forcing local governments to: (1) increase the millage rate; (2) increase some other taxes or fees; (3) reduce public services; or (4) pursue some combination of the above. Much of the literature on assessment caps, especially in the case of California, dwells on explanation (3). However, in Florida, the other alternatives may be more likely. First, as the nominal cap on the millage rate is not binding, local governments may respond to SOH and Amendment 1 by simply increasing the tax rate. Florida voters may, in fact, anticipate such a policy response as county assessors are compelled by the state's Truth in Millage Act (passed in 1980) to mail each property owner the "roll-back" millage rate on the homeowner's tax bill – the rate that would leave revenue unchanged net of new construction.[18] Second, throughout the campaign for Amendment 1, many opponents claimed it would harm public services.[19] We attempt to control for varying tastes for public goods in the empirical section, however, for now we examine the tax share implications when local governments hold revenue, R_j, constant and endogenizing the tax rate, τ_j. In Figure 3, a higher millage would pull the entire

[18] When property prices were rising, this rate would tend to fall; however, given the recent correction in house prices, the roll-back rate in many cities exceeds the actual rate. In addition to putting Amendment 1 on the ballot, the 2007 legislature forced local governments to rescind recent increases in property tax revenue (lowering future non-school tax revenue between 3 and 9 percent for most municipalities) and made the existing roll-back rate the statutory rate (Clouser and Mulkey, 2008.)

[19] Two examples of anti-Amendment 1 headlines appeared in the *Miami Herald* in the months leading up to the vote: "New Florida Residents Target Save Our Homes" (January 27, 2008) and "Tax Reform to Mean More Budget Cuts." (November 29, 2007)

budget frontier in. We represent this effect as budget set $B^{2'}$ and $B^{3'}$ for SOH and Amendment 1, respectively. Whether one is better off under SOH (or Amendment 1) depends on their lifetime mobility.

To see this more clearly, note that in the case when revenue is held constant, the household's tax liability is determined by their property's share of the total assessed value in the jurisdiction (the tax base), B_j:

$$T = \frac{V}{B_j} R_j . \tag{5}$$

The greater B_j, the smaller the individuals' tax share and the smaller there tax. However, B_j, is just the sum of the market values of all taxable parcels in the jurisdiction, less total wedges:

$$T_i = \frac{V_i - W_i}{\sum V_n - \sum W_n} R_j . \tag{6}$$

Amendment 1, therefore, alters how $\sum W_n$ erodes the tax base. While the amendment increases a households' wedge in their next home, almost certainly lowering their initial tax share *then*, it can raise the tax burden in the *current* home, as other movers port their wedges and shrink the denominator in equation (6). To see this more precisely, note that the $\sum W_n$ can be disaggregated into the sum of wedges of non-migrants, less the wedges that sellers take with them, plus the wedges buyers port into the new home:

$$T_i = \frac{V_i - W_i}{\sum V_n - \left(\sum W_n^{stayers} - \sum W_n^{seller} + \sum W_n^{buyer} \right)} R_j . \tag{7}$$

Under Save Our Homes but before Amendment 1, because of the reset to market value, the tax base is broadened by the fact that the wedge of buyers, W_n^{buyer}, was zero. However, after Amendment 1, W_n^{buyer}, will be non-zero if purchasers previously sold a

home with an exemption in Florida. Thus, if the local government's revenue needs are fixed, Amendment 1 could raise or lower a homeowner's life-time tax burden depending not just on her mobility, but on the mobility of other households in the city. Stated differently, holding a voter's own mobility constant, higher mobility by other households in the jurisdiction raises their lifetime tax burden and should lower their support for Amendment 1:

Hypothesis 3. Support for Amendment 1 falls as the rate of mobility in the rest of the tax jurisdiction increases.

Finally, the ability to port wedges across jurisdictions introduces a last element of complexity into the voter's decision. For instance, if a migrant possessing a large wedge in one Florida city moves to another city that has experienced less appreciation, it will raise the assessment share of the existing residents in the new city. This concern was voiced at the time of the vote by some north Florida counties, who feared an influx of south Florida residents porting very large wedges and provoking budget cuts or tax rate hikes. Voters generally may have responded to this concern as electoral support for Amendment 1 was much lower in relatively affordable north Florida than in expensive south Florida.[20] The impact of different types of mobility can be summarized in the fourth empirical hypotheses:

Hypothesis 4. Support for Amendment 1 increases as the relative size of migrant wedges falls.

The balance of the paper tests these hypotheses empirically.

[20] In the econometric section below we include county fixed effects in part to absorb any county-level variation in assessment methodology and thus don't exploit this variation except when interacted in column 4 of table 5.

4. Data

This study combines precinct-level vote shares for amendment 1 with parcel level information on market and assessed property value, homestead status, date of purchase them into a precinct-level analysis. We describe them in detail in this section.

4.1 Election Data

The unit of analysis is the election precinct, whose boundaries are determined by each of the 67 counties in Florida. The smallest county in our sample has 8 precincts, while the largest county has 711. Amendment 1 appeared on the ballot in the January 29, 2008, presidential primary election. All voters had the opportunity to vote on the amendment, and registered Democrats and Republicans also got to vote for a presidential candidate.[21] We obtained from the Florida Department of Elections the complete statement of votes at the precinct level. We supplemented this with GIS data of the 2008 election precincts from the Department of Elections for each county. It was not possible to obtain election results from Union County and Sumter County, so these counties were not included in our analysis.

Our dependent variable denoted y_i, is ln((number of yes votes divided by the total number of votes)*100 + 0.01).[22] There were other notable races on the ballot, and not all voters cast a vote for or against Amendment 1. When the votes were counted, however, it was a clear victory for Amendment 1. Out of 67 counties, 53 had majorities in favor. Counties that supported Amendment 1 represented the whole state, but support was especially strong in south Florida. Miami-Dade, Palm Beach and Broward counties each voted about 70 percent in favor. Supporting counties ranged widely from small to large. In contrast, counties where a majority of voters opposed Amendment 1 generally were

[21] We note that the winner of the Democratic primary could not receive any convention delegates because of a party sanction for moving the vote forward. Republican candidates received half their assigned delegates. Also, none of the leading Democratic candidates campaigned in Florida. Thus, Democratic turnout may have been depressed. We attempt to correct for political differences among precincts in some of our specifications later on.

[22] Before taking the log, we add a 0.01 so as not to exclude the several precincts that voted 0% in favor of Amendment 1. Removing these precincts from the sample did not change the results qualitatively.

small and rural. Two notable exceptions were Duval County (Jacksonville) and Leon County (Tallahassee), large counties that both voted majority no.

4.2 Property Data from County Assessor Files

To develop a measure of the tax savings that can be expected, we obtain property-level data from the Florida Department of Revenue's 2007 tax roll. This is a complete listing of all parcels (residential and commercial) and is compiled from county assessors. Santa Rosa County was dropped from the analysis because variable names could not be reconciled with the standardized names used in other countries. This leaves us with 64 counties and 6,475 precincts in our sample.[23]

Key to our analysis is the homeowners' existing Save Our Homes "wedge," the difference between the home's just value and its assessed value, both of which are reported for every parcel. County assessors are required to update a home's just value yearly, not only to account for market appreciation, but also for any additional improvements that may have been made on the parcel.[24] The assessed value for a homesteaded property that has not changed hands in the previous year cannot climb more than the SOH cap. Therefore, the wedge, W, is simply the difference between the just value and the assessed value. We then determine the precinct of each parcel and calculate the median wedge, W_i, value of that precinct for all single family, owner-occupied properties.[25] We also determine the share of property in the precinct that is currently claiming a homestead exemption.

[23] We do not expect that the three counties dropped to distort our results greatly. They are small: Union, Sumter and Santa Rosa counties have 2007 estimated populations of 14,991, 72,246 and 147,044, respectively. (US Census Bureau)

[24] Assessors use standard appraisal techniques (comparables and replacement cost valuation) to determine the just value. In addition, there is a state requirement that a home be physically inspected at least once every five years.

[25] We exclude multifamily residences (but not townhomes) for three reasons: (1) there appears to be a lack of uniformity in how assessors report these properties to the state; (2) a high degree of reporting error can arise from condo conversions; and (3) some counties appear to aggregate across units to create a single parcel level variable. We are also concerned about the high degree of sub-leasing and number investment properties within condo buildings. It is not clear to us whether a condo owner, even one currently (and

4.3 Homeowner Mobility

We expect that a household that would like to move but have a large wedge would support Amendment 1 to escape the lock-in effect. While we do not observe taste for mobility directly, we can identify neighborhoods that appear to have faster turnover. We posit that people living in neighborhoods whose previous residents have exhibited shorter tenures would also have shorter occupancies. (Or would, but for the lock-in effect of Save Our Homes.) We also attempt to model mobility and predict the *expected* mobility of current residents. These three measures are described below.

The property level data from the assessors contain the years of the latest and the second most recent sale of each parcel in the state. Dividing 1 by the average number of years between the most recent and the second most recent sale yields a measure of "churn" in the precinct.

We also rely on the U.S. Census, which asks whether a person occupied the same residence in 1995 as they did in 2000. From this question we obtain the percentage of each census block group that moved within the last five years. We average this measure (and all other census derived block group values described later) by precinct. As a precinct usually includes more than one block group, and block group boundaries are often not coterminous with precinct boundaries, we weight each block group by its share of the total number of housing units within the precinct.[26]

Finally, we construct a third measure of *expected* household mobility by estimating a duration model. Specifically, we estimate a semi-parametric hazard of

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honestly) claiming a homestead exemption on a condo unit would behave more like a homeowner or as a potential landlord when voting.

[26] To elaborate, we create a measure of lot density defined as block group population in 2000 divided by the number of single family lots and then multiply this value by the single family parcels retained from our calculation of the wedge and mobility. Thus, a block group makes a large contribution to the precinct mean mobility if it has a lot of parcels in common with the precinct and/or it contains a lot of multifamily housing. If there is no multifamily present, then the weight is simply based on the block group's share of total parcels in the precinct. We believe this weighting scheme is superior to one based simply on the coverage ratio of precinct area and block group area; a procedure often employed when a finer unit of analysis (parcel) is unavailable.

moving on the previous owners' housing spell (used to create our churn measure) and current residents' duration, which is right-censored. We assume that if the current owner of the property receives a homestead exemption, then so did the previous. We also exclude any housing spells that ended before 1995 or started after 2006. Ownership spells that ended before 1995 are relatively few (the current resident must have lived in the home for at least 13 years), and spells that end (or do not end) after 2006 may have been affected by homeowners beginning to anticipate Amendment 1, or by the recent dislocation of the housing market resulting from the collapse of the Florida property insurance market.[27] All spells that were active in 2006 are treated as right-censored. We include controls for race, income and age (drawn from the census), location, wedge size and federal tax treatment of housing capital gains resulting from the Tax Reform Act of 1997. We estimate 64 hazard models, one for each county, and then use the resulting parameter estimates to predict survival of current homeowners one, two and three years into the future. We then calculate one-, two- and three-year expected mobility as 1 divided by the share of the current owners still expected to reside in the precinct. A richer discussion of the mobility hazards are provided in the Data Appendix.

A concern in our specification is the inherent simultaneity between wedge size and mobility. We ensure identification by relying on lagged values, in the case of the churn and the census mobility measures. In estimating the hazard-derived, we control for the wedge but exclude it when we predict the current owner's duration in the home.

4.4 Other Covariates

We control for socioeconomic and demographic factors that may influence the likelihood of voting for Amendment 1, specifically block group level characteristics from the 2000 Census: percent non-Hispanic white, percent in various age groups, percent college-educated, median household income, median income squared and the percentage

[27] We thank Geoff Turnbull for pointing out this second concern. Estimating survival functions with data through 2007 does not appreciably change our results.

of the housing units that is renter-occupied.[28] In the same way as the census mobility rate is defined, each housing parcel is assigned the characteristics of the block group within which it is located. Then, the precinct average of this value is calculated, weighting by share of housing units. We also include GIS-determined distance to the nearest central business district (CBD) and include a dummy if the precinct is located in a central city of the MSA.

Voters may also be governed by ideology and may have turned out in different numbers because of the disparate treatment of Republican and Democratic contests. The Florida Senate has available 2000 presidential election data disaggregated to the block group level. We therefore assign to each parcel in our tax roll the percentage of votes cast for Al Gore in that block group. We then take a weighted average (as above) to create a precinct level variable.[29]

Finally, there are institutional and cultural differences between Florida counties, and so we include a full set of dummy variables for the 64 counties. County fixed effects are especially important for two reasons: (1) property appraisal and tax collection are done at the county level, and (2) Florida school districts are coterminous with counties, and a large portion of a homeowner's tax bill goes to the county to pay for schools. With the fixed effects, we are able to control for different assessment methods, practices and county public amenity levels. We are thus identifying the impact of tax wedge and mobility on votes across precincts within each county. Table 1 provides summary statistics of the key variables in the analysis.

[28] We also tried specifications with additional covariates including poverty rate. These do not substantively affect the results and are not reported here.

[29] While results of the Gore vs. Bush election are available by election precinct, they are based on 2000 election precinct boundaries, which are not necessarily the same as 2008 precincts. There is some concern as to the extent of vote misreporting due to poor ballot design and/or faulty ballot scanning technology as discussed in *Bush vs. Gore* 531 U.S. 70 (2000) *p. 106-107*. We believe that any under vote should be largely uniform within counties and can thus be absorbed by county fixed effects. Note that the equal protection grounds upon which *Bush vs. Gore* 531 U.S. 70 (2000) and *Bush v. Palm Beach County Canvassing Board*, 531 U.S. 70 (2000) were largely decided highlighted inconsistencies in the hand recounting of presidential under votes (e.g. hanging chads), but as the election results as certified represents the second running of machine ballots but excludes (per the Supreme Court's decree) most hand recounts, we believe this is not a concern for our empirical analysis.

5. Analysis

To test our hypotheses, we first estimate a reduced-form linear regression of share of yes votes at the election precinct level on current tax wedges, measures of expected mobility and a set of controls.

The formal specification is:

$$y_i = \mathbf{X}_i'\Phi + \boldsymbol{\alpha} W_i + \theta M_i + u_i \qquad (8)$$

where y_i is the log share of yes votes in the precinct, X_i is the vector of control variables (which include a full set of county fixed effects), W_i is the median size of the tax wedge between just and assessed value, M_i is a measure of average mobility in the precinct and an error term, u_i. First, we test the null hypothesis H_0: $\boldsymbol{\alpha} = 0$, the size of the median wedge did not affect the share voting yes. Our alternative hypothesis is that precincts with a larger median wedge between market and assessed values will vote for the right to port those tax savings to a new home (H_a: $\boldsymbol{\alpha} > 0$). Similarly, we test the null hypothesis: H_0: $\theta = 0$, the average mobility of a household does not affect the precinct's share voting yes. The alternative is that precincts with higher mobility will vote for the right to port those tax savings to a new home (H_a: $\theta > 0$).

5.1 Simple Mobility Measures

Estimation results using simple measures of mobility are reported in Table 2. All specifications in this table include a set of county fixed effects, and standard errors are robust to heteroskedasticity. We begin by looking at the median wedge in each precinct, *W*. In the simplest regression (Column 1) with no other covariates except county controls, *W* is significant and positive as expected, suggesting that the portability of the wedge is attractive to precincts with high potential tax benefits. However, the magnitude of the parameter on *W* is small: increasing the wedge by $70,000 (the equivalent of increasing the wedge by one standard deviation) raises the yes share vote by 1.4%. For the precinct

with the mean yes share of 63%, this translates to barely one percentage point increase. However, this is the only specification in which W positively and significantly raises the yes share.

Column 2 provides parameter estimates after the inclusion of a rich set of additional control variables. The yes vote share in a precinct falls with educational attainment and rises with the proportion white. Living in the central city reduces the likelihood of support. The precinct's median income is insignificant. Precincts with a high share of very young and the elderly have lower levels of support for Amendment 1. This may reflect greater reliance on local public services that may suffer if Amendment 1 impacts local budgets. After including these covariates, the estimated coefficient of W is statistically non-significant at the 5 percent level. Given that a positive wedge is a necessary, but not sufficient, condition for the lock-in hypothesis, we find the small and insignificant parameter estimates on the wedge variable striking and suggest that support for Amendment 1 may have been driven by other considerations.

Columns 3 and 4 suggest that mobility plays an important role in determining support for Amendment 1. The churn measure (1 divided by the average of the previous residents' duration in their homes) is positive and significant so that precincts with shorter ownership spells are more likely to support Amendment 1. The magnitude of the churn suggests that a one standard-deviation increase in churn increases the yes share by 0.44 percentage points at the mean. The census measure of mobility implies a much larger effect.[30] Increasing the 5-year mobility rate by one standard deviation increases the share yes vote by 2.49 percentage points at the mean.

Column 5 includes both the wedge and the churn measures. Despite the likely correlation between wedge and mobility, including both variables does not alter either coefficient estimate. Finally, not every parcel receives the homestead exemption, usually because it is a second home or a vacation residence. Column 6 includes the percentage of the precinct receiving the homestead exemption. The sign for this variable is negative but

[30] Note that while the census mobility definition encompasses renters who move as well as owners we for the level of renters in the precinct separately.

insignificant, which may seem counterintuitive. However, non-homestead property owners are, almost by definition, ineligible to vote and thus owners in low-homestead areas may expect the law to shift more of the burden onto non-residents and absentee landlords.[31] We test for such tax-share shifting considerations in section 6.

5.2 Predicted Mobility Measures

Table 3 reports regression results from specifications incorporating the hazard-derived measures of mobility. Again, mobility seems to play an important role in support for Amendment 1. Whether we include a measure of expected mobility 1, 2, or 3 years into the future (Columns 1, 2 and 3), the estimated parameter is significant and positive.[32] The magnitudes are in line with the census mobility measures; increasing the 1-year expected mobility rate by one standard deviation increases the yes share by 0.30 percentage points at the mean. The impact is about four times greater for two-year mobility. However, the coefficient estimate on average wedge size remains insignificant.

In Column 4 we interact wedge size and predicted 1-year mobility. Recall from the discussion in Section 3, that if expected future house price appreciation is modest, then an existing wedge and future mobility is necessary for Amendment 1 to lower future taxes. T the (wedge×mobility) interaction is positive and significant at the five percent level. This suggests mobile households with a larger tax wedge were more likely to support Amendment 1. Putting the results from this prospective mobility measure with the simple retrospective mobility measures implies support for Hypothesis 2.

[31] On the other hand, the marginal buyer in low-homestead areas may be a non-homesteader and a current resident seeking to maintain their property value could oppose Amendment 1 for the same reason childless couples support school bonds (Hilber and Mayer, 2004).

[32] The standard errors may suffer from a generated-regressor problem as the expected mobility measures were created by predicting the survival in the home of each property owner and then averaging this value for each precinct. There is no ready analytical method for correcting the errors when the first stage is estimated at a lower level of analysis. Experiments with bootstrapping the errors for two randomly drawn counties did not appear to grow our estimated standard errors, however any attempt to employ this strategy for the entire state would be very computationally intensive. Instead we treat Table 3 as a robustness check of the churn and census mobility measures.

Finally, we control for underlying political ideology to guard against concerns about the irregular Democratic and Republican primaries. Column 6 of Table 2 includes the percentage of the precinct that supported Al Gore in the 2000 presidential election. The estimated coefficient is negative and highly statistically significant. To the extent that the variable represents a relatively liberal precinct, this result suggests that voters on the political left are less likely to support Amendment 1. In any case, controlling for ideology does not change our parameter estimates for wedge or expected mobility.

6. Curbing the Leviathan or Lowering Tax Share?

We now expand the specification in an attempt to understand voters' expectations as to the likely response of their local government after passage of Amendment 1. Leading up to the Amendment, proponents claimed that it would lower taxes, while many opponents of the measure claimed it would adversely affect the budgets of municipal and county governments. This suggests that both proponents and opponents expected local governments to respond to Amendment 1, in part, by cutting expenditures.

We test this hypothesis by turning to the existing literature on ethnic homogeneity and support for public goods to see whether Amendment 1 had greater support in communities that, ex ante, might have been more interested in curbing the "Leviathan" of local government. Alternatively, voters may have expected local governments to maintain revenues by raising taxes on other property or simply raising the millage rate on owner-occupied property. We augment our reduced-form linear regression equation with several jurisdiction-level measures and a jurisdiction specific-error term:

$$\begin{aligned} y_i &= \mathbf{X}_i'\Phi + \boldsymbol{\alpha} W_i + \theta M_i \\ &+ S_j'\sigma + C_j'\lambda + I_j'\gamma + \theta_2 \frac{M_i}{M_j} + e_j + u_i \end{aligned} \qquad (9)$$

where S_j is a vector of population heterogeneity variables in the jurisdiction (indexed j), C_j is a vector that decomposes the share of the assessed value comprised of each property type, I_j is a vector that decomposes type of migrants to the tax jurisdiction and the ratio is

relative mobility. We describe each variable in turn below, outline our predicted effect and then add them to our specification.

6.1 Presence of racial and ethnic heterogeneity

Examining county government data, Alesina, Glaeser and Sacerdote (2002) find evidence that racial heterogeneity may lower expenditures on public goods because voters are less able to identify with likely recipients or because likely beneficiaries find it harder to form political coalitions across ethnic lines. Voters may care more about the tax savings and individual benefits of portability if they do not support the redistributive effects of local public services that benefit racial or ethnic groups other than their own. We formulate two measures of dissimilarity, both based on the race categories from the Census. The first is a measure of racial heterogeneity that is the probability that two randomly drawn individuals in a municipality (or unincorporated county) will be of a different race.[33] The second is the coefficient of dissimilarity that measures the degree of segregation across a municipality for any given level of racial heterogeneity in the population. A larger value suggests that blacks and Latinos are more geographically concentrated within the jurisdiction.[34]

The first two columns of Table 4 present the estimates. Controlling for share non-Hispanic white at the precinct level, Column 1 shows that more heterogeneous towns were less likely to support Amendment 1. This result is inconsistent with our null hypothesis. However, Column 2 finds that controlling for a given level of racial and ethnic heterogeneity, precincts living in more segregated towns were more likely to support Amendment 1. This is as expected and suggests that cities that are *a priori* less

[33] This measure is defined in Alesina, Baqir and Hoxby (2004) as $1-\sum_i (group_i)^2$ where $group_i$ is the share of the population in the tax district that is non-Hispanic white, non-Hispanic black and Hispanic, respectively.

[34]We also consider the possibility that voters do not perceive the overall racial composition of their city or town but instead look only at their immediate surroundings so we create an alternative measure: racial heterogeneity at the census tract level. Again, because these indices are calculated at a geographical level different from the precinct, we weight the indices at our unit of analysis. Qualitative results from these measures are not significantly different, and so they are not reported here, although they are available from the authors.

receptive to potentially redistributive public services (as given by their level of segregation) are more likely to favor the tax cutting potential of Amendment 1. We take the combined findings as mixed evidence that voters expected Amendment 1 to actually lower expenditures. For the balance of the paper we will explore whether voters consider possible tax-shifting strategies by their municipality.

6.2 Presence of non-homestead and non-residential property

The portability rule affected only homesteaded residential properties. Thus, homesteaded voters may have been more willing to support Amendment 1 if they believed that revenue loss from their declining assessments would be made up by higher taxes on non-homestead or non-housing property.[35] Thus, one explanation for the insignificant parameter estimates on share homestead in the previous regressions is that a high homestead rate suggested that there are fewer other properties that can shoulder the tax burden.[36] In Column 3 of Table 4, we include the share of the jurisdiction's tax base that is currently receiving a homestead exemption. Our prior is that a high *jurisdiction* homestead rate should lower support while a high *precinct* homestead increases support because it contains large number of households who could benefit from portability.[37] However, the estimated parameter on jurisdiction homestead rate is positive, though not statistically different from zero. In Column 4, we include three new measures of the tax base of the precinct's jurisdiction: the share of the jurisdictional tax base that is residential, commercial and industrial.[38] We note that the estimate on the share of homesteaded residential land (-0.107 + 0.516 = 0.409) is not significantly different from share commercial or industrial. It also is not statistically different from the share of non-

[35] Dye, McMillen and Merriman (2006), for instance, show that the residential assessment cap in Illinois resulted in higher tax bills for commercial property owners and residents ineligible for the cap. See Bradbury (1988) and Calabrese et al (2006) for similar evidence from Massachusetts.

[36] There is of course a potentially off-setting consideration. Current homesteaders are potential sellers to non-homesteaders. If the marginal buyer of homes in a given neighborhood is likely to be a snow-bird (non-homestead recipient) the current voter may oppose Amendment 1 for fear of jeopardizing their home values.

[37] Though not shown, Table 4 includes the share renting from the 2000 census, so we believe the share non-homestead is capturing ownership of second homes, a large component of the housing market in Florida.

[38] These do not add up to 1 because of additional tax base categories such as institutional and agricultural property. Agricultural land under Florida's Greenbelt law is taxed based on current use and is generally difficult to tax.

homestead residential land. These findings suggest that voters did not expect their local government to offset Amendment 1 by raising taxes on non-residential or non-homestead properties.

6.3 Migration and Relative Mobility

The reason homestead property owners might be ambivalent about Amendment 1 is that while they might like to port an exemption at some time in the future, so will other homeowners. The ultimate tax burden hinges on their mobility, but also the mobility of fellow residents. A citizen living in a city where there are many migrants coming in from other parts of Florida may expect these migrants to put pressure on local expenditures while not contributing to the tax base – thus dampening support for tax portability. On the other hand, residents living in towns with high rates of migration from out of state can rely on these "wedge-less" buyers to reset the assessed value and slow the erosion of the tax base even after the passage of Amendment 1.

Column 1 of Table 5 provides the baseline result for this analysis. We use the 2000 census measure of tax jurisdiction (city-level) mobility and precinct level mobility. This specification also includes all of the jurisdiction tax-base share measures from Column 4 of Table 4. While precincts with high rates of mobility are more likely to support Amendment 1, controlling for precinct (own) mobility, voters in high-mobility *jurisdictions* do not appear to be more likely to support Amendment 1.

However, in Column 2 of Table 5 we include out-of-state mobility into the jurisdiction. Cities with a large share of out-of-state immigrants are significantly more likely to support Amendment 1: a one-standard-deviation increase in the share of residents from out of state increases support for Amendment 1 by 2.7 percentage points. Given the large magnitude of this coefficient, compared to the previously estimated coefficients, we believe this evidence is consistent with some strategic consideration on the part of voters, validating Hypothesis 4. At the same time, the parameter estimate on jurisdiction mobility which now captures the effect of in-state migration is negative and significant. Residents in cities with high rates of in-state migration can expect the assessed value of land to grow more slowly as wedges start to be ported around, and

controlling for their own desire to port a wedge, they are more likely to oppose Amendment 1.

We further divide the in-state migrants into those coming from the same county and those coming from a different county in Column 3 of Table 5. The resulting coefficient estimates do not appear to be statistically different from one another, which may be consistent with the notion that voters do not distinguish between which county in Florida sends the migrants to their jurisdiction. However, not all in-state migrants are equal. If a voter lives in a locality where the average wedge is low, relative to other localities in the state, it is likely that the average in-migrant's wedge will be relatively large. Put differently, the assessment base of a low-wedge jurisdiction is more exposed to disruption from in-state migration than is a high-wedge district. To the extent that these produce countervailing effects, this may explain why the in-state migration coefficient variable is insignificant. In order to test this alternative hypothesis, more data are needed to determine *from where* a jurisdiction's in-state immigrants come.

We obtain from the Internal Revenue Service the U.S. Population County-to-County Migration Data for 2008. This data, compiled from individual tax returns, report the number of new residents who moved to each U.S. county and the county or state where they migrated from. Because the data are created annually, they represent a more accurate snapshot of migration during inter-censal years. For each of the 64 counties in our analysis we create the average "county immigrants' wedge," which is the weighted sum of the average wedges in the other 63 Florida counties, with the weights being the relative frequency of migration as given by the IRS data.[39] Now, as our specifications include county fixed effects, simply putting this calculated average into our regressions would be ineffectual; therefore, our control variable is the ratio of the jurisdiction's average wedge to the county immigrants' wedge. Thus, identification is based on the fact

[39] Here is a simplified example: County A receives migrants from only two counties: 30% come from County B and 70% come from County C. The average wedge enjoyed by residents of County B is $50,000, and the average wedge of County C is $80,000. The "county immigrants' wedge" of County A is then (0.3)($50,000) + (0.7)($80,000) = $71,000. In our calculations, we would use all the Florida counties that send migrants to County A.

that different jurisdictions within a county have different existing wedges. Column 4 reports the results. The coefficient on this ratio is positive and significant at the 10% level. Thus, if a jurisdiction has larger average wedges, relative to wedges ported in from other Florida counties, voters are more likely to support Amendment 1. This is consistent with the voters in this jurisdiction recognizing that the immigrants will not greatly erode the tax base with their ported wedges, and so the immediate tax cuts Amendment 1 provides may dominate in a voter's decision-making. This finding gives some credence to why north Florida municipalities were so adamantly opposed to Amendment 1 and why south Florida remained relatively silent. However, we note that the magnitude of our finding is small, which may be due to the lack of jurisdiction-level mobility data at our disposal.

As a final examination of the tax shifting considerations in voting behavior, we look at relative mobility as opposed to relative wedge. We construct new variables based on the ratio of a precinct's own mobility relative to other homeowners in the same jurisdiction. The hypothesis is that if people in one precinct are relatively less likely to move than those in other precincts in the same jurisdiction, they should be more willing to oppose the amendment because their own tax bill will rise. We again employ previous owners' churn as our proxy for current owners' mobility, but the following results are robust to other measures of mobility. Column 5 of Table 5 provides the parameter estimates for the relative measure. Note that own precinct's parameter on churn is now negative but *relative* churn is positive, though neither is statistically different from zero at the 5 percent cut-off. However, when we limit the sample to cities with twenty-five or more precincts in order to mitigate the effect of having precinct churn included as both the numerator and the denominator of the ratio (Column 6), we find that both the churn and relative churn parameters become strongly significant; combined, the marginal effect, calculated at the means, is positive. In other words, support for Amendment 1 increases in precincts that are *relatively* more mobile compared with other precincts in the same town. We take this as further evidence for Hypothesis 4, that voters understand the fundamental shifting in tax burdens that portability would provide. Under the original Save Our Homes provisions, long-stayers could expect the tax burden to slowly shift to

high-mobility households. Amendment 1 reverses that effect and, assuming it leads to an increase in the millage rate or other taxes, causes the tax-share of long duration residents to rise. Thus, Amendment 1 acted as a way for high-mobility households to shift the burden back to the low-mobility ones, and the voting results are consistent with this view.

7. Conclusion

While many states have introduced property assessment caps in order to limit the taxing power of local governments, Florida's Amendment 1 was the first statewide provision that allows the benefits of the assessment caps to be portable within the state. This policy shift may significantly improve the mobility of homeowners and increase the efficient matching of homeowners to homes. The differential tax burdens that the amendment generates allow us to test whether voters recognized the fiscal impact of this provision upon themselves and upon others. Precinct-level voting data from the referendum were regressed on socioeconomic, geographic and political variables. The key explanatory variables are the potential tax wedge formed by the difference between the just value and the assessed value of a house and various measures of household mobility. These variables are derived from a complete statewide tax roll of properties. We find evidence that voters with high expected mobility were more likely to support Amendment 1 but the size of the existing wedge was not an important determinant.

However, we also found evidence to suggest that voters understood that Amendment 1 would likely erode the tax base and shift the tax burden to long-staying residents.. The results suggest that voters anticipate the response of local budgets and millage rates to the new portability, and are weighing the short-term tax savings against longer-term consequences on the local budget and tax rates.

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Data Appendix A: Creating a Measure of Expected Mobility

The specification for the hazard of moving function is:

$$h(t) = h_0(t)\exp(X'\beta).$$

where the baseline hazard, $h_0(t)$, is estimated non-parametrically and then shifted proportionally by changes in a vector of covariates *X*. We include in *X* Census 2000 controls for the block group that the property is located in: income and income squared; share of population that is non-Hispanic white; educational attainment; and share of population in the following age groups: 0-4, 5-13, 14-17, 18-24, 25-64, and 64 plus. We also include the property's distance from the CBD as a control.[40] Building on the work of Sinai (1997), Newman and Reschovsky (1987) and Cunningham and Engelhardt (2008), we also include the following variables to account for lock-in effects generated by the federal treatment on capital gains in owner occupied housing: occupancy spell completed before 1997; capital gain in excess of $125,000; (occupancy spell completed before 1997*capital gain in excess of 125,000); occupancy spell completed after 1997; and (occupancy spell completed after 1997*capital gain in excess of $500,000). We run each model separately by county yielding 64 separate regression estimates. Some summary statistics of the parameter estimates for the county regressions are presented in Appendix Table A2. The full set of coefficient estimates is available from the authors upon request.

Using the estimated hazard functions and the coefficient estimates on the covariates, we calculate for each house the survival probability that the current owner will remain in the house (in other words, we ignore the previous owners' tenure) and set capital gains to zero to predict survival in the absence of a property tax lock-in effect. The predicted survival curve is thus:

$$\hat{S}(t) = \hat{S}_0(t)^{\exp(X'\hat{\beta})}$$

[40] These additional covariates, for the most part, appear in the main voting equation as well, and so they are described in greater detail in the "Other Covariates" section of the paper.

where the non-parametrically fitted baseline survival curve, $\hat{S}_0(t)$, is shifted proportionally by the exponeniated independent variable multiplied by the parameter estimates $X'\hat{\beta}$. Next we estimate the probability of the current owner remaining in the home *n* years into the future. We do this by moving *n* years (we do this for *n* = 1, 2 or 3 years) down the survival curve and then shifting it by the current set of covariates and parameter estimates (excluding capital gains):

$$\hat{S}(t+n) = \hat{S}_0(t+n)^{\exp(X'\hat{\beta})}.$$

Finally, we take the difference between the current survival curve and the projected future survival curve and annualize the change in probabilities to create a measure of expected future mobility with passage of Amendment 1:

$$mob_n = \Delta\hat{S}(t) = \frac{\hat{S}(t)-\hat{S}(t+n)}{n}.$$

Thus, mob_n is determined by both the underlying duration dependence of the data –a household, having lived ten years in a home is less likely to move next year than a household having lived in a home for just three years – and by characteristics of the census block group in which the property resides – high income individuals tend to move more. Like the other independent variables, the expected mobility term is then averaged at the precinct level. The precinct average expected mobility is denoted M^n_i, *n* = 1, 2, 3.

Generally, we find that mobility falls with the share of children in the block group, increases with income and educational attainment and increases for non-Hispanic whites. We also find some evidence for lock-in effects from the tax treatment of capital gains on owner occupied housing. Homes in census block groups with higher shares of persons over 55 appear to enjoy a bump up in mobility before 1997 relative to after 1997, and having a gain of more than $125,000 (above the maximum one time exclusion pre-1997) was associated with reduced mobility compared to after 1997. This effect was strongest for homes in block groups with a larger share of persons age 55 and over. Similarly, gains in excess of $500,000 (the maximum post-1997 exclusion) lowered mobility after 1997 relative to before 1997.

Figure 1a. Comparison of Yearly Increase in Assessed Value Allowed by Save Our Homes and Yearly Increase in FHFA State House Price Index

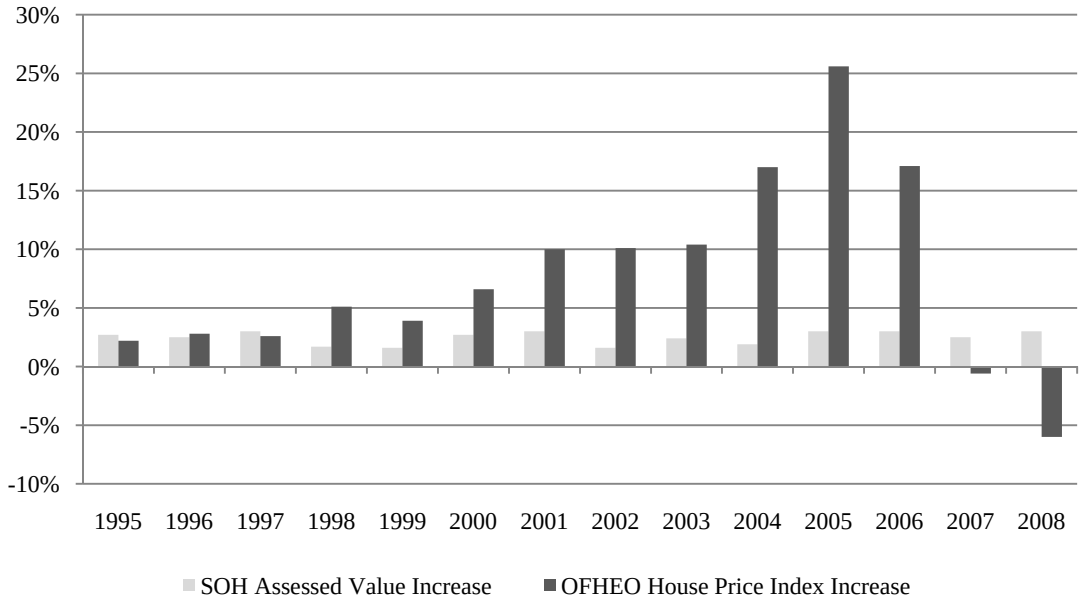
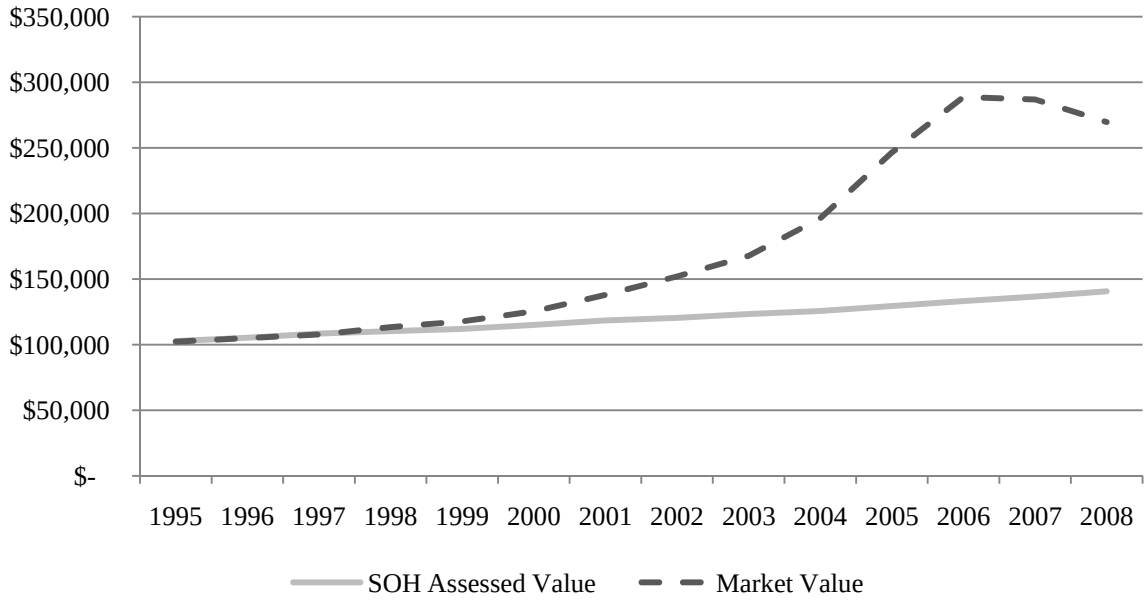
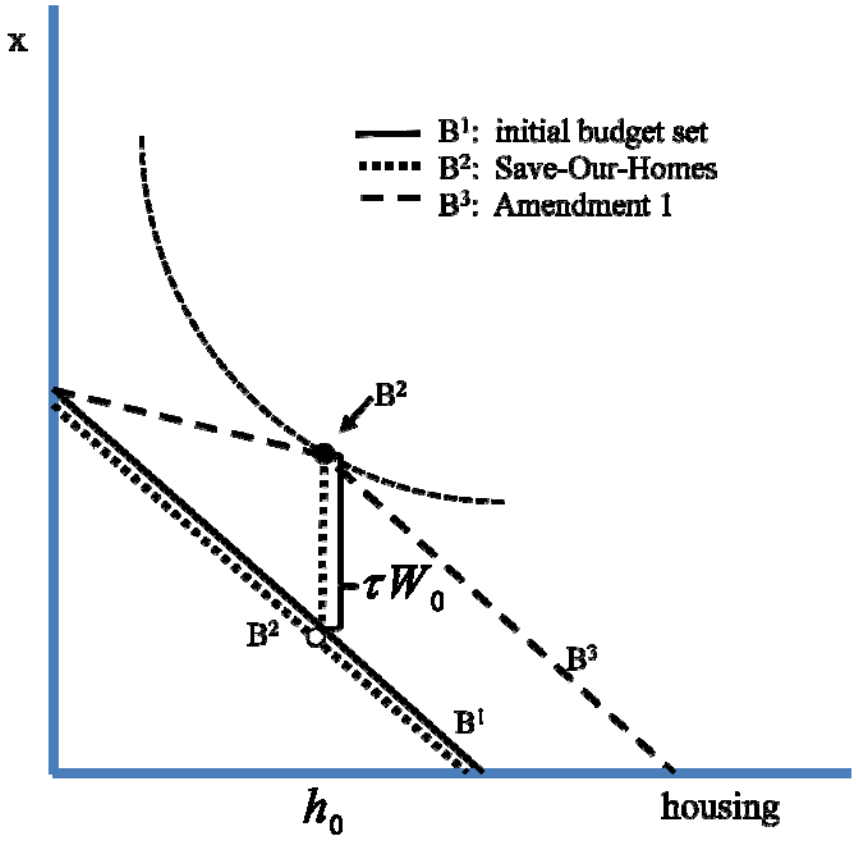


Figure 1b. Comparison of Assessed Value and Market Value of a Hypothetical Home*



*This graph is based upon the following assumptions: (1) A house is bought for $100,000 on December 31, 1994; (2) It is homesteaded and is not bought or sold thereafter; (3) Its value appreciates at the same rate as the statewide FHFA house price index.

Figure 2. Lock-in Effect of Assessment Cap and Amendment 1 on Housing Consumption



Note: to highlight the impact of the wedge between market and assessed values this figure we show the current budget when inflation is greater than 3 percent (the nominal cap in assessment growth). A similar graph with real house price appreciation above the inflation cap would pivot the budget line in and strand the household in the current home.

Figure 3. Lifetime Mobility and After-Tax Consumption Under Different Assessment Regimes

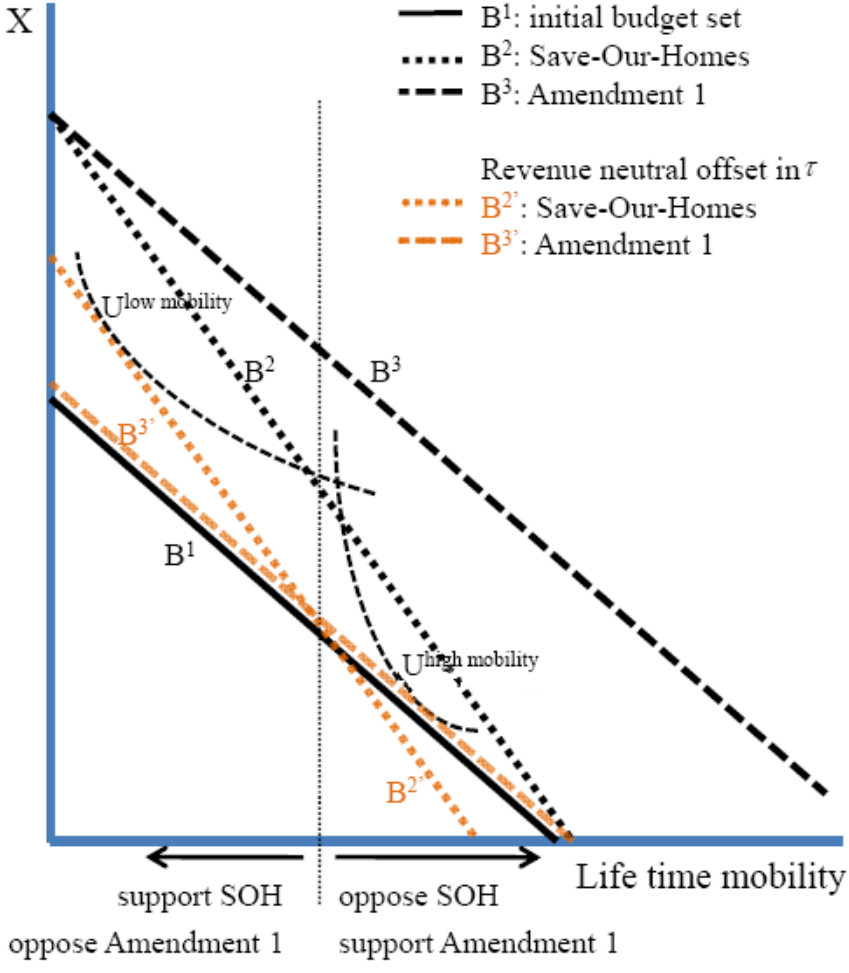


Table 1. Summary Statistics of Variables Used

	(1) Full Sample*		(2) Restricted Sample*	
	Mean	S.D.	Mean	S.D.
Share of Votes "yes" (percentage	63.1	(12.17)	62.3	(12.22)
Wedge in $1,000s (market price - capped price)	48.773	(70.043)	0.619	(0.676)
Measures of Mobility:				
Moved in last 5 years (census)	0.501	(0.120)	0.505	(0.126)
Moved into district from out of state	0.160	(0.052)	0.154	(0.041)
Moved into district from out of county	0.089	(0.053)	0.085	(0.051)
Churn (1/previous owner's duration)	0.190	(0.603)	0.195	(0.761)
Relative churn – churn/churn in other precincts in tax jurisdiction	1.02	(0.300)	1.02	(0.300)
1-yr expected mobility	0.071	(0.013)	0.071	(0.012)
2-yr expected mobility (annualized)	0.059	(0.011)	0.059	(0.010)
3-yr expected mobility (annualized)	0.055	(0.010)	0.055	(0.009)
Educational Attainment:				
Some college	0.286	(0.065)	0.287	(0.065)
Bachelor's deg.	0.145	(0.088)	0.145	(0.088)
Graduate deg.	0.083	(0.065)	0.0834	(0.067)
Age Composition:				
Age 0-4	0.056	(0.022)	0.058	(0.021)
Age 5-14	0.127	(0.047)	0.129	(0.047)
Age 15-17	0.037	(0.014)	0.038	(0.015)
Age 18-24	0.076	(0.052)	0.079	(0.058)
Age 65 and above	0.189	(0.142)	0.180	(0.142)
Other Controls:				
Median income (log)	44.0	(19.3)	43.9	(18.7)
Non-Hispanic white (percent)	69.5	(27.4)	66.3	(28.7)
Share receiving homestead exemption	0.558	(0.221)	0.219	(0.219)
Share voting for Gore in 2000 general	0.507	(0.169)	0.524	(0.176)
Racial concentration-tax district	0.40	(0.17)	0.44	(0.15)
Racial dissimilarity	49.62	(48.64)	51.53	(43.49)
Dummy - central city	0.20	(0.38)	0.44	(0.15)
Distance – CBD	12.9	(11.8)	11.4	(8.9)
Observations	6371		3968	

*The *full sample* is the set of all precincts in the 64 counties. The *restricted sample* is the set of the precincts located in jurisdictions that have 25 or more precincts.

Table 2. Determinants of Vote Share – Wedge and Simple Mobility Measures
Dependent Variable = ln([Yes votes/(Yes + No)]*100 + 0.01)

	(1) Wedge	(2) Additional controls	(3) Churn	(4) Census 5-year mobility	(5) Wedge + Churn	(6) + Share with homestead exemption
Wedge (just – assessed value)	0.0002**	0.00004			0.00003	-0.0001+
	(0.0001)	(0.0001)			(0.0001)	(0.00007)
Churn			0.012**		0.012**	0.014**
			(0.003)		(0.028)	(0.003)
Census mobility rate				0.316**		
				(0.076)		
% with homestead exemption						0.105
						(0.072)
Some college		-0.067	-0.063	-0.129	-0.065	-0.112
		(0.111)	(0.111)	(0.104)	(0.112)	(0.112)
Bachelor's deg.		0.269	0.283	0.182	0.281	0.260
		(0.224)	(0.230)	(0.221)	(0.227)	(0.219)
Graduate deg.		-0.470**	-0.472**	-0.470**	-0.479**	-0.461**
		(0.179)	(0.175)	(0.171)	(0.181)	(0.179)
Age 0 to 4		-0.782+	-0.781+	-1.400**	-0.780+	0.860+
		(0.412)	(0.412)	(0.447)	(0.412)	(0.443)
Age 5 to 14		-0.271	-0.240	-0.091	-0.244	-0.256
		(0.241)	(0.245)	(0.260)	(0.242)	(0.237)
Age 15 to 17		-0.820	-0.685	0.103	-0.694	-0.895
		(0.742)	(0.740)	(0.805)	(0.748)	(0.800)
Age 18 to 24		-0.095	-0.074	-0.164+	-0.075	-0.082
		(0.090)	(0.090)	(0.089)	(0.091)	(0.093)
Age 65 and above		-0.165**	-0.122**	-0.097*	-0.123**	-0.145**
		(0.043)	(0.044)	(0.048)	(0.044)	(0.047)
Median income		0.001	0.0004	0.0003	0.0004	0.0001
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Median income^2		1.90e-6	2.42e-6	2.68e-6	2.38e-6	4.77e-6
		(8.00e-6)	(8.29e-6)	(8.11e-6)	(8.24e-6)	(9.27e-6)
Non-Hispanic white		0.001+	0.001*	0.001*	0.001*	0.001*
		(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0003)
% Renters		-0.0002	-0.0002	-0.001+	-0.0002	-3.42e-6
		(0.0005)	(0.0005)	(0.0006)	(0.001)	(0.0005)
Precinct located in central city		-0.034**	-0.033**	-0.025*	-0.033**	-0.033**
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Distance to CBD		-9.28e-7	-0.0001	0.0001	-0.00004	-0.00002
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	3.853**	4.006**	3.984**	3.874**	3.987**	3.961**
	(0.032)	(0.071)	(0.067)	(0.079)	(0.072)	(0.065)
Observations	6473	6471	6428	6471	6428	6428
R-squared	0.211	0.222	0.221	0.227	0.222	0.223

All specifications include county fixed effects. For scaling purposes, Wedge is measured in $1,000s. Robust standard errors in parentheses. +Significant at 10% level; *Significant at 5% level; **Significant at 1% level.

Table 3. Robustness Check / Alternative Measures of Mobility / Controls for Partisanship

Dependent Variable = ln([Yes votes/(Yes + No)]*100 + 0.01)

	(1)	(2)	(3)	(4)	(5)
	Expected Mobility			Wedge ×	Political
	1-year	2-year	3-year	Mobility	Indicator
Wedge	-0.0001	-0.0001	-0.00001	-0.0002+	-0.0001
	(0.0001)	(0.0001)	(0.00004)	(0.0001)	(0.0001)
1-yr exp. mobility	0.375**			0.338*	0.343**
	(0.129)			(0.132)	(0.131)
2-yr exp. mobility		1.399**			
		(0.530)			
3-yr exp. mobility			0.093		
			(0.177)		
Wedge*1-yr mobility				0.001*	0.001*
				(0.0004)	(0.0004)
Vote for Gore					-0.264**
					(0.030)
% with homestead	0.036	0.107	-0.054*	0.038	0.018
exemption	(0.053)	(0.081)	(0.022)	(0.054)	(0.055)
Some college	-0.078	-0.084	-0.095+	-0.077	0.007
	(0.100)	(0.106)	(0.052)	(0.100)	(0.103)
Bachelor's deg.	-0.078	0.367+	0.133	0.160	0.216
	(0.100)	(0.206)	(0.126)	(0.138)	(0.139)
Graduate deg.	-0.553**	-0.520**	-0.582**	-0.558**	-0.417*
	(0.167)	(0.177)	(0.138)	(0.167)	(0.165)
Age 0-4	-0.342	-0.697*	-0.120	-0.332	-0.285
	(0.220)	(0.347)	(0.196)	(0.218)	(0.215)
Age 5-14	-0.358+	-0.265	-0.567**	-0.336	-0.122
	(0.214)	(0.234)	(0.114)	(0.218)	(0.216)
Age 15-17	-1.270+	-1.163	-0.704**	-1.237+	-1.035
	(0.746)	(0.785)	(0.267)	(0.742)	(0.752)
Age 18-24	-0.147*	-0.167**	-0.124*	-0.130*	-0.074
	(0.064)	(0.063)	(0.061)	(0.064)	(0.062)
Age 65 and above	-0.167**	-0.166**	-0.135**	-0.161**	-0.072+
	(0.037)	(0.039)	(0.031)	(0.036)	(0.040)
Median income	0.002	-0.001	0.004**	0.002	-0.0003
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
Median income^2	-3.09e-6	8.20e-6	-0.0001**	-4.76e-6	5.25e-6
	(5.86e-6)	(9.79e-6)	(3.47e-6)	(5.46e-6)	(5.98e-6)
Non-Hispanic white	0.001**	0.001**	0.001**	0.001**	-0.0001
	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0002)
% Renters	-0.0001	-0.0003	-0.0001	-0.0001	-0.0004+
	(0.0002)	(0.004)	(0.0002)	(0.0002)	(0.0002)
Precinct located in	-0.020*	-0.022*	-0.030**	-0.021**	-0.017*
central city	(0.008)	(0.087)	(0.005)	(0.008)	(0.0007)
Distance to CBD	0.001+	6.18e-6	0.001*	0.001+	0.001+
	(0.001)	(0.001)	(0.0004)	(0.001)	(0.001)
Constant	3.898**	3.757**	3.969 **	3.895**	4.077 **
	(0.072)	(0.113)	(0.066)	(0.072)	(0.076)
Observations	6338	6307	6274	6338	6338
R-squared	0.382	0.265	0.541	0.382	0.392

All specifications include county fixed effects. For scaling purposes, Wedge is measured in $1,000s. Robust standard errors in parentheses. +Significant at 10% level; *Significant at 5% level; **Significant at 1% level.

Table 4. Curbing Expenditure vs. Shifting the Tax Burden?

Dependent Variable = ln([Yes votes/(Yes + No)]*100 + 0.01)

	(1) Tax district racial heterogeneity	(2) Tax district racial dissimilarity	(3) Share of tax base covered by homestead exemption	(4) Share of tax base by property class
Wedge (just – assessed value)	-0.0001 (0.0001)	-0.00004 (0.0001)	-0.00004 (0.0001)	-0.00004 (0.0001)
Churn	0.012** (0.002)	0.011** (0.002)	0.011** (0.002)	0.011** (0.002)
% with homestead exemption	0.048 (0.076)	0.051 (0.076)	0.035 (0.067)	0.047 (0.069)
Vote for Al Gore in 2000	-0.211* (0.089)	-0.203* (0.090)	-0.206* (0.087)	-0.228** (0.077)
Jurisdiction wide variables				
Racial Heterogeneity (tax jurisdiction)	-0.177* (0.072)	-0.202** (0.073)	-0.180** (0.053)	-0.144** (0.044)
Racial Dissimilarity (tax jurisdiction)		0.0001** (0.0001)	0.001** (0.0001)	0.0004** (0.0001)
Share of tax base[1] covered by:				
• Homestead exemption			0.124 (0.130)	-0.107 (0.103)
• Residential (inclusive of homesteads)				0.516* (0.213)
• Commercial				0.457 (0.293)
• Industrial				0.366 (0.372)
Constant	4.233** (0.106)	4.224** (0.107)	4.187** (0.115)	3.930** (0.209)
Observations	6393	6393	6393	6393
R-squared	0.276	0.279	0.280	0.289

[1]Excluded category is agricultural, which is assessed based on current use.

All specifications include county fixed effects and all demographic controls. For scaling purposes, Wedge is measured in $1,000s. Robust standard errors, clustered at the jurisdiction level, in parentheses. +Significant at 10% level; *Significant at 5% level; **Significant at 1% level.

Table 5. Types of Migrants, Portable Wedges and Relative Mobility

Dependent Variable = ln([Yes votes/(Yes + No)]*100 + 0.01)

	(1) Jurisdiction mobility	(2) + Out-of-state mobility	(3) + In-state mobility	(4) +Accounting for source of migrants	(5) Relative mobility	(6)
					Full sample[1]	Restricted sample[1]
Wedge	-5.97e-6	-0.00001	-0.00001	0.00001	-0.00004	-0.00004
	(6.03e-5)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Mobility	0.203**	0.203**	0.204**	0.200**		
	(0.048)	(0.048)	(0.049)	(0.054)		
Jurisdiction-wide mobility	-0.018	-0.474**	-0.523**	-0.590**		
	(0.095)	(0.100)	(0.105)	(0.107)		
Jurisdiction-wide mobility from outside Florida		0.810**	0.841**	0.891**		
		(0.156)	(0.143)	(0.191)		
Jurisdiction-wide mobility from another Fla. county			0.094	0.134		
			(0.112)	(0.099)		
Jurisdiction's average wedge				-0.003		
				(0.003)		
Ratio of jurisdiction wedge to county immigrants' wedge[2]				0.009+		
				(0.005)		
Churn					0.0005	-0.010*
					(0.009)	(0.005)
Relative churn (own precinct churn / jurisdiction average churn)					0.002	0.003**
					(0.001)	(0.001)
• Marginal effect						0.01**
						(0.001)
Constant	3.875**	4.006**	4.008**	3.956**	3.911**	3.902**
	(0.228)	(0.208)	(0.209)	(0.255)	(0.212)	(0.112)
Observations	6435	6435	6435	6435	6303	3918
R-squared	0.292	0.296	0.296	0.297	0.289	0.341

[1] The *full sample* is the set of all precincts in the 64 counties. The *restricted sample* is the set of the precincts located in jurisdictions that have 25 or more precincts.

[2] See text for explanation of how the weighted county immigrants' wedge is calculated.

"Mobility" is the census-derived 5-year mobility rate. All specifications include county fixed effects, all demographic controls, controls for racial concentration, segregation and share of tax base classified as homestead, residential, commercial and industrial, consistent with the specification presented in Column 4 of Table 4. For scaling purposes, Wedge is measured in $1,000s. Robust standard errors, clustered at the jurisdiction level, in parentheses. +Significant at 10% level; *Significant at 5% level; **Significant at 1% level.

Appendix Table A1. Maximum Increase in Assessed Value Allowed Under Save Our Homes and the Implicit Wedge for a Home Purchased in 1995.

Year	CPI Change	Maximum Assessed Value Increase Under SOH	OFHEO State House Price Index Increase	"Wedge" between just and assessed property value for a home purchased before January 1st 1995
1995	2.7%	2.7%	2.2%	0.0%
1996	2.5%	2.5%	2.8%	0.0%
1997	3.3%	3.0%	2.6%	0.0%
1998	1.7%	1.7%	5.1%	2.7%
1999	1.6%	1.6%	3.9%	4.8%
2000	2.7%	2.7%	6.6%	8.3%
2001	3.4%	3.0%	10.0%	14.1%
2002	1.6%	1.6%	10.1%	20.8%
2003	2.4%	2.4%	10.4%	26.5%
2004	1.9%	1.9%	17.0%	36.0%
2005	3.3%	3.0%	25.6%	47.5%
2006	3.4%	3.0%	17.1%	53.8%
2007	2.5%	2.5%	-0.6%	52.4%
2008	4.1%	3.0%	-6.0%	47.8%

Appendix Table A2. Summary of Parameter estimates from 66 Cox proportional hazard models of mobility[1]

	mean parameter estimate	Positive[2]	Not significant[2]	Negative[2]
Education (share)[3]				
some college	0.071	24	26	16
Bachelors	0.462	28	30	8
Graduate Degree	-0.074	22	34	10
Age distribution				
Share of pop 5-14 yrs old	-0.008	13	30	23
Share of pop 15-17 yrs old	-1.797	9	27	30
Share of pop 18-24 yrs old	0.668	14	32	20
Share of pop 65+ yrs old	-0.002	12	31	23
Income (000s)	0.013	19	33	14
Income^2	-0.0002	14	33	19
Share non-Hispanic	0.0001	17	35	14
Distance to CBD	-0.001	15	29	22
Capital gains (000s)[4]	-0.002	5	24	37
Federal Capital Gains Parameters				
Dummy spell completed pre-97	-1.318	0	3	63
Share population over age 55	-0.0002	17	17	32
Share population over age 55*Pre-97	0.0003	35	17	14
Dummy: gain>125K	0.034	29	18	19
Dummy: gain>125K*pre-97	-0.642	0	6	60
capgainovr125k_pre97age55	0.0001	22	23	21
Dummy: gain>500K	0.019	18	27	21
Dummy: gain>125K*post-97	-0.201	3	20	43

[1]Residence spell is defined as the time, in years, between the purchase and sale of the home by the previous owner or purchase year and 2008 for the current owner.

[2]Significance based on a 5-percent cut-off using a two tailed test.

[3]All variables relating to age, education and income are drawn from 2000 census block group summary statistics.

[4]Capital gain is either the realized gain: sales price less purchase price or for right censored spells the difference between purchase price and assessor determined "just value."