Voters Hold the Key:

Lock-in, Leviathan and Local Political Economy*

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Abstract

Fifteen states have enacted caps on the annual growth in assessed property values. Why do voters choose to limit local government in this way? Reasons may include controlling the power of special interests, addressing agency failures of government officials, or mitigating uncertainty associated with future property tax liability. Yet research has found that voters' perception of a limitation's fiscal consequences often do not match reality. To counter this, another literature argues that support for tax limitations is driven not by perceptions of government inefficiency, but by reasonable expectations of who will ultimately bear the tax limitation's burden.

We examine voter support for a 2008 constitutional amendment in Florida, which included a unique provision making a homeowner's accrued tax savings portable within the state. To gauge whether voters were voting according to a rational understanding of the rule's burden, we test three somewhat competing hypotheses for voter support: because they were locked in to their current house, because they hoped to reduce local government expenditure or because they wished to minimize their tax share.

Employing a rich dataset of every property in Florida, we predict the support for the amendment based on the voters' existing tax exemptions, mobility and other demographic variables. We find that the average size of a precinct's current exemption was much less important than mobility in predicting support. We then test whether vote shares for Amendment 1 are more consistent with an attempt to lower municipal expenditures or to lower one's one tax share. We suggest that voters were aware of how the law change might shift their tax share. Yes votes increase when a jurisdiction has high rates of out-of-state migration but decrease with high rates of in-state migration. Support also appeared to decrease when a precinct's mobility was lower *relative* to other precincts in the same city.

Keywords

Property tax limitations; property tax; voting; assessment cap; lock-in; homeowner mobility; local public finance; political economy.

1. Introduction

Since the property tax revolts began with California voters' approval of Proposition 13 in 1978, voters in almost every state has imposed some form of property tax limitation on cities (Hoyt *et al*, 2009). While research has been directed at assessing the impact of these laws on local public finance (Downes, 1992; Figlio, 1997), considerable effort has sought to understand why voters would choose to restrict local governments' revenue raising ability in this way. Voters may support limitations because they believe tax cuts will improve local government efficiency rather than reduce public services (Citrin, 1979; Ladd and Wilson, 1982; Oates, 1985). Consistent with this belief, Cutler, Elmendorf and Zeckhauer (1999) find that voters' personal tax liabilities color their view of government efficiency.

On the other hand, several studies have shown that voters' perceptions of the consequences of tax limitations do not match the reality, questioning the rationality of voter behavior (Figlio and Rueben, 2001; Doyle, 1994). Addressing this debate, Fischel (1989) counters that support for Proposition 13 was driven by a (reasonable) expectation that revenue would be redirected to other constituencies, while Anderson and Pape (2008) suggest that current voters do not trust future voters to guard their interests. Thus, support for property tax limitations may not be driven by voters' concern that their local government is unresponsive, but instead by fears of shifting tax burdens and services between citizens or over time.

While intended to stem rising property taxes, limitations may impair the housing market by inducing homeowners to overstay in their current residence. This distortion arises particularly because tax limitation legislation usually includes a provision for an *assessment cap*, in which the taxable, assessed value of the house cannot climb as fast as the market value. Because the cap remains in place until the homeowner moves, inequity arises when the property tax bills of two similar houses differ because of the lengths of tenure of the residents. Distorted housing consumption can generate efficiency loss as the match quality between a homeowner's desired housing services and those provided by the current unit deteriorates over time (O'Sullivan, Sexton, and Sheffrin, 1995a; 1995b). At the same time, overstaying may reduce the supply of the existing housing, slowing household formation and increasing demand for new housing at the

urban fringe. (Wassmer, 2008) Existing empirical work, primarily focusing on Proposition 13, has, with the exception of Nagy (1997), found that households subject to an assessment cap showed reduced mobility (Bogart, 1990; Stohs, Childs and Stevenson, 2001; Wasi and White, 2005; Ferreira, 2007). This finding is consistent with long staying residents being "locked-in" to their current home. At the same time, more innately mobile households will still move more often than less mobile households and thus tend to bear a disproportionate share of the tax burden over their lifetime.

While there is a literature looking at assessment caps' effect on residential mobility, we turn the question around and ask why voters support caps. We test the hypotheses that voters understand the mobility consequences of tax limitations and then go on to test whether they recognize the likely impact of the law on their tax share. We take into account three factors: a voter's relative benefit from the cap, the impact the cap has on local budgets and the ability to shift the voter's tax share onto other households. We examine these hypotheses in the context of a recent and novel referendum that altered Florida's existing assessment cap to make it portable to a new home within the state.

In 1995, Florida voters passed the "Save Our Homes" (SOH) constitutional amendment, which capped assessed values to the lesser of the rate of inflation or three percent, so long as the home remains the owner's primary residence. Florida went on to experience a dramatic increase in home values, and long-time homeowners, especially in fast-appreciating south Florida, enjoyed substantial tax savings from the growing difference between a home's "just value" (market value) and its assessed value.[1] Like assessment caps in other states, SOH benefits reset when the homeowner moves, creating a lock-in effect. This feature of SOH contributed to public concern that declining mobility was inflicting further pain on the slumping real estate market. Further, declining mobility may harm state revenues that rely, in part, on transaction fees associated with home sales. In response, Amendment 1, was placed on the January 29, 2008, presidential primary ballot. In addition to several other provisions, the constitutional amendment

[1] For example, as of 2008, despite recent declines in house prices, a homeowner who purchased her primary residence before 1995 and who experienced the average rate of house price appreciation in the state had an assessed value that was 48 percent below current market value. This value is based on the OFHEO purchase only house price index and an assessed value capped at the lesser of the CPI-U or 3 percent.

altered the SOH legislation by including the novel provision that homeowners could "port" up to 500,000 dollars of their current exemption to a new Florida residence. This represented the first instance in the United States where portability of tax savings was extended throughout a state.[2]

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 finances 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 migrants from other parts of Florida may erode the tax base further by porting their accrued tax exemption in. In the post Amendment 1 environment, municipalities must either raise the tax rate or rely increasingly on non-homestead property and new Florida residents to increase the tax base. Rational voters thus had to balance their potential tax savings, their likelihood of moving, the possible impact on public goods and the response of local governments when deciding whether to support Amendment 1. In this paper, we attempt to identify key determinants of support for the amendment, which ultimately passed with 60% of the vote.

We combine novel, house-level assessor property records for all but three Florida counties with precinct level election data and 2000 census block group data. We predict the share of the vote voting yes to Amendment 1 based on the expected average mobility rate and the existing tax savings (the "tax wedge") from Save Our Homes. The richness of our data allows us to devise a methodology to separate out the tax savings effects of the amendment from the mobility effects. We find that precincts with high rates of expected mobility are more likely to vote yes, though the presence of an existing wedge appeared to do little for Amendment 1 support. The share yes vote declines with educational attainment, the prevalence of children and the prevalence of elderly, and it rises with distance from the CBD and income.

In the second part of the analysis, we examine whether the election results demonstrate that voters exhibited some strategic consideration in how the burden of the Amendment would be distributed. We control for the composition of the tax base, the source of migrants and voters'

[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.

expected mobility relative to others in the jurisdiction. We find evidence that more racially segregated cities, a possible determinant of support for public goods, had a higher yes share. However, more heterogeneous cities tended to oppose the amendment. A precinct's yes share increased with its share of out-of-state migrants but fell with the share of in-state migrants, suggesting voters recognized the implication of new portable wedges on the tax base. Finally, we find that mobility *relative* to other precincts in the same town appears to increase support for the Amendment. The results from this section suggest that voters were savvy as to how tax shares would likely shift among homestead recipients if the amendment passed. Putting the evidence together, we argue that voters are rationally weighing the individual and short-run benefits of the portability amendment against the longer-term public finance consequences.

Section 2 details the original Save Our Homes exemption and the proposed Amendment 1. Section 3 lays out the theoretical framework and three 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

In 1995, 54 percent of Florida voters approved changing the state's constitution with the "Save Our Homes" (SOH) amendment. The provisions of Save Our Homes apply only to a homestead, a property that serves as the primary residence of the owner. Homeowners were (1) given a standard $25,000 homestead exemption on assessed value and (2) had the yearly increase in assessed value capped at the lesser of three percent or the rate of inflation (based on the CPI for urban consumers).[3] Table 1 shows 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 annualized appreciation in the OFHEO house

[3] In addition to the standard $25,000 homestead exemption, the amendment also provides 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, there is also a senior citizen's exemption in some jurisdictions. (Section 193.155(1), F.S.)

price index is reported in the second column of the Table, and the third column provides the resulting "wedge" for a property purchased before 1995 that experienced the average state appreciation rate. In subsequent years, 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).[4]

Like Proposition 13 in California and similar measures in other states, the assessed value resets to the market price upon sale.[5] The large difference between market or "just" value and assessed value, is called the "tax wedge" (or simply "wedge") and was believed to lock families into their existing homes.[6] This supposed lack of mobility, combined with the popular perception that property taxes were still too high, contributed to the desire to alter the SOH provisions once more.[7] On January 29, 2008, 64 percent of Floridians voted to approve Amendment 1. This constitutional amendment, which goes into effect for 2008 property taxes, has four elements: (1) the homestead exemption is doubled to $50,000 for non-school taxes; (2) a $25,000 exemption is created for business property; (3) beginning in 2009, an annual cap of 10 percent on assessed value is placed on all non-homesteaded property, including rental properties, second homes and commercial properties; and (4) the homeowner's tax wedge is made "portable" to new homes within the state. It is provision (4) of the amendment that is at the center of our analysis, although we will discuss how the other provisions, especially element (1), affect our results later on.

The statewide portability of the SOH tax 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

[4] 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.

[5] 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.

[6] Lock-in occurred in both directions of mobility: 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.

[7] Charlie Crist, who was elected governor of Florida in 2006, had 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.

new home, up to a maximum portable cap of $500,000. An example may be useful. Say a homeowner purchased a home in 1994 for $100,000 and that by 2008 it has a just value (assessor determined market value) of $270,000 and an assessed value of $140,000. The wedge between market price and assessed price is $130,000. This homeowner moves up to a home with a just value of $300,000. Without portability, the assessed value of the new house is $300,000.[8] With portability, the assessed value is $170,000 (= $300,000 – $130,000).[9] 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 (= 230,000*(130,000/270,000)).

Voters potentially confronted a difficult calculation of projected benefits in deciding whether or not to support the referendum.[10] In the next section, we set up a simple theoretical framework that provides us with hypotheses that we take to the data.

3. Theoretical Framework

A voter's support for Amendment 1 is based primarily on the change in the expected property tax bill. In general, an individual voter's tax bill, T, can be described by the equation:

$$T = \tau V \qquad (1)$$

where τ is the jurisdiction's property tax (millage) rate, and V is the market value of the house. Without Save Our Homes, V is the assessed value. [11] The introduction of the original SOH legislation in 1995 capped the growth in assessed value. The assessed value is the lesser of

[8] 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.

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

[10] 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.

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

market price (should the price decline) or the capped value since the date of purchase (less the $25,000 exemption). After SOH, but before Amendment 1 a property's tax liability is written as

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

where V is the just market value and $\bar{V}$ is the capped value. The difference between a home's market value and just 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 for the new house and thus the household's real expected future tax liability can be written as:

$$E[T] = E\left[\int_0^{t_2} \tau_1(V_1 - W_1)e^{-rt}dt + \int_{t_2}^{t_3} \tau_2(V_2 - W_2)e^{-rt}dt + \int_{t_3}^{t_4} \tau_3(V_3 - W_3)e^{-rt}dt + \ldots\right] \tag{3}$$

where t_* denotes the timing of moves and r is the real rate of interest. Assuming a constant real rate of house price appreciation, a, the real value of the wedge can be expressed as a function of the purchase date t_* and purchase price, V_{t_*}:

$$W(t) = V_{t_*}\left(1 - e^{a(t-t_*)}\right). \tag{4}$$

The longer one remains in their home, the more valuable one's wedge and the more costly moving becomes; this is the "lock in" effect.

Amendment 1 doubled the initial homestead exemption and introduces wedge portability. The property tax bill can now be rewritten as:

$$T = \tau(\min\left(V - W, V\frac{W}{V^{prev}_{t_2}}\right) - 50K) \tag{5}$$

where: $W(t) = V_{t_0}\left(1 - e^{a(t-t_0)}\right)$.

The future value of the wedge is now a function of the purchase value and date of the *previous* home. If a person buys a home of greater value, then their assessed value is the market value

less the real dollar wedge value from the previous home. If they buy a home that costs less than the sale price of the previous home they can claim the same ratio of assessed to actual value.

For tractability, assume a homeowner only goes on to buy a home of equal value and, because of the troubled Florida real estate market, expected future house price appreciation is zero. Thus, some current homeowners are endowed with an assessed value wedge based on when and where they bought their current home, but do not expect any future appreciation. Expected future taxes after Amendment 1 can be expressed as follows:

$$E[T] = E\left[\int_0^{t_2} \tau_1(V_1 - W_1)e^{-rt}dt + \int_{t_2}^{t_3} \tau_2(V_2 - W_1)e^{-rt}dt + \int_{t_3}^{t_4} \tau_3(V_3 - W_1)e^{-rt}dt + ...\right]. \quad (6)$$

Amendment 1 makes the current wedge, W_1, effectively permanent as long as one continues to own a home in Florida and eliminates the lock-in effect. Borrowing heavily from O'Sullivan (1995b), we assume that the quantity of housing services provided to a particular owner declines over time as employment locations move, taste for local amenities change and appeal of the structure type evolve. Homeowners with school age children may move to gain access to a better school district, new parents may prefer a home with more bedrooms and aging owners may seek out single-floor residences. Assuming an exponential decay, the flow of housing services can be expressed as:

$$h = \left[\int_0^{t_*} e^{-drt}dt\right] \quad (7)$$

where d is the depreciation in family-house-match quality, which is household specific. A homeowner's optimal number of moves is thus conditional on declining match quality. Finally, consumption of non-housing services in the next home can be expressed as:

$$y - V_1 q - \tau_2(V_2 - W_1) \quad (8)$$

where y is income and q is the annual real mortgage payment per dollar of house value.

Given these tradeoffs, a current homeowner with an existing wedge must choose the timing of moves, t_*, and their support for Amendment 1 conditional on the quality of their current home and the utility from non-housing consumption. Current housing services is a function of the household's idiosyncratic match quality depreciation, d, and the date of purchase t_1.

First note that households with a large wedge have an incentive to extend their time in the current house beyond when they would move in the absence of Save Our Homes. These are the households "locked-in" to their current houses. Thus, support for Amendment 1 should be increasing in d.[12] Next, the presence of a current wedge, W_1, should also induce support for Amendment 1.[13] If local jurisdictions do not raise their tax rates following the passage of amendment 1, then the effect of Amendment 1 must be to lower public expenditures. Voters trade off future tax savings against immediate and future cuts in public services. Thus we have the following two hypotheses for voter support of Amendment 1:

> Hypothesis 1: Support for Amendment 1 increases with the tax wedge and with mobility (the locked-in voter).
>
> Hypothesis 2: Support for Amendment 1 decreases with the demand for local public services (the Leviathan-tamer).

At the same time, while many advocates for Amendment 1 (including Governor Crist) claimed that its passage would result in lower local property taxes, we believe that most local governments would respond by raising the millage rate to offset some or all of the erosion in the tax base.[14] If we endogenize τ_j such that jurisdictions set it to achieve a pre-determined amount

[12] While d is unobservable, we experiment with several proxies in the empirical section based on the current occupants' duration in the home, and the share of the population that had been in the same home for more than 5 years from the census.

[13] It is possible that a voter who does not currently have a wedge or even owns a home could support Amendment 1 on the premise that they could enjoy future tax savings on subsequent house price appreciation. However, at the time of the vote, house prices in Florida were on a decidedly negative trajectory and the chance of generating a new wedge based on excess appreciation in future years was probably discounted. If expected future appreciation rates are lower than the statutory cap, then an existing wedge is a necessary but not sufficient condition to support Amendment 1.

[14] This increase in millage may in part be unavoidable: Since 1980, county assessors have been required to disclose a property's "roll-back rate"- the millage rate necessary to hold revenue constant in real terms. The objective of the

of revenue, *R*, then the homeowner's only determinant of tax liability is their property's share of total assessed value, *B*:

$$T = \frac{V}{B} R . \quad (10)$$

Thus a homeowner future tax liability may hinge not only on her ported wedge, but on all the other wedges ported into and around the next jurisdiction:

$$T_2 = \frac{V_2 - W_1}{\sum V_i - X_2} R_2 \quad \text{where: } X_2 = \sum W_i^{stayers} - \sum W_i^{sellers} + \sum W_i^{buyers}. \quad (11)$$

Before Amendment 1, the tax base was eroded by growing wedges of existing residents but was replenished as people moved and their assessed value reset. After Amendment 1, the tax base is further eroded by wedges being ported in by buyers (the final term in X_2). It is theoretically possible that Amendment 1 could raise the tax base if it induced marginal stayers (lock-ins) to move out of the jurisdiction and they sell their homes to buyers with smaller or no wedges. However, we expect that most moves are probably within jurisdiction (given that most moves are within county) and that for most cities and towns, Amendment 1 almost certainly lower the assessed tax base. Thus, one's future tax liabilities depend not only on one's ported wedge but also on the wedges ported into and out of the jurisdiction following the law. This implies that a tax-minimizing voter should only support Amendment 1 if their own wedge exceeds average net decrease in the tax base:

$$W_1 > \left(\sum_i W^{buyers} - \sum_i W^{sellers} \right) / B_2 , \quad (12)$$

where B_2 is the pre-reform tax base in the next home.

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law was to force local governments to acknowledge real tax increases that may otherwise be obscured by an individual property's rise in value. The 2007 legislature, at the Governor's behest, created a hard roll-back rate by capping the increase in local property tax revenue to no more than the increase in per capita income. However, recent declines in real estate markets combined with SOH have led to a falling tax base and an increase in the roll-back tax rate over the previous year's rate.

Finally, in addition to altering the calculation of future tax savings by moving, Amendment 1 has the potential to raise taxes in the current home *immediately* as new buyers begin to port their wedges:

$$T_1 = \frac{(V_1 - W_1)}{\sum V_i - X_1} R_1 \quad \text{where: } X_1 = \sum W_i^{stayers} - \sum W_i^{sellers} + \sum W_i^{buyer}. \qquad (13)$$

Thus, even an immobile homeowner must take into consideration how the tax base may be altered by the entry and exit of residents into her jurisdiction; in other words, Amendment 1 should depend on *relative* mobility and *relative* wedge size. A tax-minimizing voter would have to consider the mobility rate of other homeowners in her jurisdiction and the likely size of their ported wedge. For instance, a voter who expected to stay in her home for a long time *relative* to others in her town may end up paying *higher* taxes after the passage of Amendment 1 if incoming migrants from other parts of Florida port large wedges into her jurisdiction. By substituting the expressions from (11) and (13) into (6), the expected tax bill of the voter is expressed as

$$E[T] = E\left[\int_0^{t_2} \frac{(V_1 - W_1)}{\sum V_i - X_1} R_1 e^{-rt} + \int_{t_2}^{t_3} \frac{(V_2 - W_1)}{\sum V_i - X_2} R_2 e^{-rt} + ..\right]. \qquad (13)$$

A tax minimizing voter should support Amendment 1 if W_1 is larger than the (discounted time-weighted) average wedges, X_1, X_2. Note that empirically, it is impossible to know when or where a voter expects to move, let alone the mean of the net ported wedges. However, if we endogenize the current property tax rate and assume that all moves are within the same jurisdiction and that homeowners start with the same initial wedge, then the only determinant of support for Amendment 1 is *relative* mobility: Amendment 1 allows high-mobility households that were bearing an increasing share of the tax burden under SOH to shift some of the burden back to the less mobile, implying the following:

> Hypothesis 3: Support for Amendment 1 decreases with the probability that the tax-share of the current house increases.

To summarize, Hypothesis 1 is based around a certainty degree of myopia on the part of voters – they are simply concerned with escaping the lock-in effect. Hypotheses 2 and 3 reveal different expectations about the likely response of local government. Will the city cut expenditures or raise taxes elsewhere to compensate for its shrinking tax base? We address Hypothesis 1 in Section 5 and Hypotheses 2 and 3 in Section 6.

4. Data

This study uses data from a variety of sources and combines 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.[15] 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).[16] There were other notable races on the ballot, and not all voters

[15] 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.

[16] 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.

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 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.[17]

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.[18] 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-

[17] 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)

[18] 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.

occupied properties.[19] We also determine the share of property in the precinct that is currently claiming a homestead exemption.

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 turn-over. 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 SOH. 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. 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 ask 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

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

boundaries, we weight each block group by its share of the total number of housing units within the precinct.[20]

Finally, we construct a third measure of *expected* household mobility by estimating a duration model. Specifically, we estimate a semi-parametric hazard of 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.[21] 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 but the intuition for this and the other measures is that we address the inherent simultaneity between wedge size and mobility by relying on lagged measures (in the first two cases) and by controlling for the wedge in estimating the hazard but excluding the wedge when we predicted the current owners duration in the home.

[20] 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.

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

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 of the housing units that is renter-occupied.[22] 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.[23] 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

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

[23] 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.

impact of tax wedge and mobility on votes across precincts within each county. Table 2 provides summary statistics of the key variables in the analysis.

5. Analysis

To test our hypotheses, we 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:

$$y_i = \mathbf{X}_i'\Phi + \boldsymbol{\alpha} W_i + \theta M_i + u_i \qquad (14)$$

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. Specifically, 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 3. 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, presumably due to the correlation of income with education and suburban status. The signs on the youngest and the eldest the age groups are negative and significant, (the omitted category is share 25-65) indicating that the presence of young children and the presence of senior citizens are both associated with lower levels of support for Amendment 1. This may reflect a concern that local public services may suffer if Amendment 1 impacts local budgets, or they could reflect that households with young children or seniors simply are unlikely to move and hence to take advantage of the portability provision. 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 parameter estimates on the wedge variable striking and suggests 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, despite including renters (which we also control for), implies a much larger effect. 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 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.[24] We test for such tax-share shifting considerations in section 6.

5.2 Expected Mobility Measures

Table 4 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 2, 3 and 4), the estimated parameter is significant and positive.[25] 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. Results suggest that the higher the expected mobility in a precinct, the more likely that precinct is to support Amendment 1. However, the coefficient estimate on average wedge size remains insignificant, suggesting that even when we attempt to isolate the impact of mobility on tax wedge, the wedge is, in and of itself, not a strong predictor of support for Amendment 1.

The specification results presented in Column 5 interact wedge and 1-year mobility. Recall from the theoretical discussion in Section 3, that if expected future house price appreciation is less than the SOH cap, then an existing wedge is a necessary condition for

[24] 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).

[25] 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 4 as a robustness check of the churn and census mobility measures.

support of Amendment 1. While the wedge remains negative and insignificant 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. However, 1-year mobility remains positive and not statistically different from the un-interacted parameter estimate, suggesting that high-mobility households anticipate future house price appreciation. Putting the results from this prospective mobility measure with the simple retrospective mobility measures implies support for Hypothesis 1.

Finally, we control for underlying political ideology to guard against concerns about the irregular Democratic and Republican primaries. Column 6 of Table 3 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 precinct that is relatively liberal, 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 One's 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, particularly those with substantial in-migration from other parts of the state, as these migrants would port large wedges into the district. This suggests that both proponents and opponents expected local governments to respond to Amendment 1 by cutting expenditures. To test this hypothesis (number 2 from our theoretical framework), we first turn 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.

To test this hypothesis, we augment our reduced-form linear regression equation with several jurisdiction-level measures and a jurisdiction specific-error term:

$$y_i = \mathbf{X}_i'\Phi + \boldsymbol{\alpha} W_i + \theta M_i + S_j'\sigma + C_j'\lambda + I_j'\gamma + \theta_2 \frac{M_i}{M_j} + e_j + u_i \quad (15)$$

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 the 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 will be of a different race.[26] The second is the coefficient of dissimilarity that measures the degree of segregation across a taxing jurisdiction for any given level of racial heterogeneity in the population. A larger value suggests that blacks and Latinos are more concentrated within the jurisdiction. We also consider the possibility that voters do not perceive the overall racial

[26] 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.

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.[27]

Columns 1 and 2 of Table 5 present the estimates. Controlling for share non-Hispanic white at the precinct level, more heterogeneous towns were less likely to support Amendment 1, suggesting that these residents may be content with their current level of service. However, Column 2 finds that controlling for any given level of racial and ethnic heterogeneity, precincts living in more segregated towns were more likely to support Amendment 1. A one standard deviation increase in dissimilarity increased the yes share by 0.31 percentage points at the mean. We take the combined findings as mixed evidence that voters expected Amendment 1 to actually lower expenditures, which implies some support for Hypothesis 2. 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.[28] 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.[29] In Column 3 of Table 5, 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

[27] Again, because these indices are calculated at a geographical level different from the precinct, we weight the indices at our unit of analysis.

[28] 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.

[29] 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.

support.[30] However, the estimated parameter on jurisdiction homestead rate turns out to be positive though not statistically different from zero.

Going further, in Column 4, we include three new measures of the tax base of the precinct's jurisdiction[31]: the share of the jurisdictional tax base that is residential, commercial and industrial.[32] The omitted category, the share of assessed value that is agricultural or institutional, appears to be negatively associated with a yes vote, given that the other three shares are positive and significant. This is not surprising given the political and statutory barriers to taxing this class of land. Within the remaining categories, the parameter estimate on the share of homesteaded residential land (-.107+.516=.409) is not significantly different from share commercial or for that matter industrial. It also is not statistically different from the share of non-homestead residential land. These findings suggest that voters did not expect their local government to offset Amendment 1 by raising taxes on non-homestead properties.

6.3 Migration and Relative Mobility

The most remarkable feature of Amendment 1 is the wedge portability. While one might like to port one's exemption at some time in the future, so will other current homeowners. The ultimate tax burden one experiences hinge on one's mobility, but also the mobility of fellow town 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.

Column 1 of Table 6 provides the baseline result for this analysis. We use the 2000 census measure of tax jurisdiction (city-level) mobility and precinct level mobility. This

[30] Though not shown, Table 5 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.
[31] Here and later in the paper, "jurisdiction" refers to a city or town if the precinct in located in an incorporated area, and to the county if it is in an unincorporated area.
[32] 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.

specification also includes all of the jurisdiction tax-base share measures from Column 4 of Table 5. 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, which is inconsistent with a tax-share minimizing strategy presented in Hypothesis 3.

However, in Column 2 of Table 6 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. 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 in-county and out-of-county but in-state migrants, in Column 3 of Table 6. The resulting coefficient estimates do not appear to be statistically different from one another. However, not all in-state migrants are equal. If a voter lives in a county where the average wedge is low, relative to other counties in the state, it is likely that the average in-migrant's wedge will be relatively large. This will place substantial pressure on local budgets, and the support for Amendment 1 should be lower. In column 4 we show the parameters when we interact the in-state, out-of-county mobility rate with the average county wedge. The parameter estimates on both the in-state mobility and the interaction term are not statistically different from zero. Perhaps this occurs because most out-of-county moves are still likely to be within the same metro area and thus porting similar sized wedges. However, without knowing the origin of county of the migrating households, we cannot conclusively test for this hypothesis.

As a final examination of the tax shifting considerations in voting behavior, 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 is likely to 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 6 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 3, 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-churn 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 claim.

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 fundamental policy shift will potentially have significant impact on the mobility of homeowners and 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 complicated 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 were 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 were derived from a complete statewide tax roll of properties. We found 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.

In addition, we have found evidence that support for Amendment 1 increased with income, distance from the CBD where public goods tend to be concentrated, and with racial segregation, consistent with certain households' interest in lowering local public expenditures. However, we also found evidence consistent with Amendment 1 voters trying to shift the tax burden on to new homebuyers and back onto long staying residents. The results suggest that voters strategically anticipated the response of local budgets and millage rates to the new portability, and they were able to weigh the short-term tax savings benefits against longer-term consequences on the local budget and tax burdens.

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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.[33] 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 A1. 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:

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

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

[33] 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.

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.

Table 1. 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%

Table 2. Summary Statistics of Variables Used in Analysis

	(1) Full Sample*		(2) Restricted Sample*	
	Mean	S.D.	Mean	S.D.
Share of Votes "yes" (percentage points)	63.1	(12.17)	62.3	(12.22)
Wedge in $1,000s (market price – capped price)	48.773	(70.043)	53.900	(70.406)
Measures of Mobility:				
Moved in last 5 years (2000 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 in home	0.190	(0.603)	0.195	(0.761)
Relative churn – churn/churn in other precincts in tax jurisdiction	1.02	(0.30)	1.02	(0.30)
1-yr expected mobility (expected change in survival)	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 election	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 3. Determinants of Vote Share for Amendment 1 – Wedge and Simple Mobility Measures

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

	(1) Wedge between assessed and market value	(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 0-4		-0.782+	-0.781+	-1.400**	-0.780+	0.860+
		(0.412)	(0.412)	(0.447)	(0.412)	(0.443)
Age 5-14		-0.271	-0.240	-0.091	-0.244	-0.256
		(0.241)	(0.245)	(0.260)	(0.242)	(0.237)
Age 15-17		-0.820	-0.685	0.103	-0.694	-0.895
		(0.742)	(0.740)	(0.805)	(0.748)	(0.800)
Age 18-24		-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 4. Robustness Check / Alternative Measures of Mobility and Controls for Political Ideology

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

	(1) Wedge	(2) Expected Mobility 1-year	(3) 2-year	(4) 3-year	(5) W*M interaction	(6) Political control
Wedge (just – assessed value)	-0.0001+	-0.0001	-0.0001	-0.00001	-0.0002+	-0001
	(0.0001)	(0.0001)	(0.0001)	(0.00004)	(0.0001)	(0.0001)
1-yr expected mobility		0.375**			0.338*	0.343**
		(0.129)			(0.132)	(0.131)
2-yr expected mobility			1.399**			
			(0.530)			
3-yr expected mobility				0.093		
				(0.177)		
Wedge*1-yr mobility					0.001*	0.001*
					(0.0004)	(0.0004)
Vote for Al Gore in 2000						-0.264**
						(0.030)
% with homestead exemption	0.107	0.036	0.107	-0.054*	0.038	0.018
	(0.067)	(0.053)	(0.081)	(0.022)	(0.054)	(0.055)
Some college	-0.113	-0.078	-0.084	-0.095+	-0.077	0.007
	(0.110)	(0.100)	(0.106)	(0.052)	(0.100)	(0.103)
Bachelor's deg.	0.249	-0.078	0.367+	0.133	0.160	0.216
	(0.217)	(0.100)	(0.206)	(0.126)	(0.138)	(0.139)
Graduate deg.	-0.446*	-0.553**	-0.520**	-0.582**	-0.558**	-0.417*
	(0.176)	(0.167)	(0.177)	(0.138)	(0.167)	(0.165)
Age 0-4	-0.852*	-0.342	-0.697*	-0.120	-0.332	-0.285
	(0.435)	(0.220)	(0.347)	(0.196)	(0.218)	(0.215)
Age 5-14	-0.271	-0.358+	-0.265	-0.567**	-0.336	-0.122
	(0.240)	(0.214)	(0.234)	(0.114)	(0.218)	(0.216)
Age 15-17	-1.023	-1.270+	-1.163	-0.704**	-1.237+	-1.035
	(0.789)	(0.746)	(0.785)	(0.267)	(0.742)	(0.752)
Age 18-24	-0.095	-0.147*	-0.167**	-0.124*	-0.130*	-0.074
	(0.091)	(0.064)	(0.063)	(0.061)	(0.064)	(0.062)
Age 65 and above	-0.177**	-0.167**	-0.166**	-0.135**	-0.161**	-0.072+
	(0.044)	(0.037)	(0.039)	(0.031)	(0.036)	(0.040)
Median income	0.0002	0.002	-0.001	0.004**	0.002	-0.0003
	(0.002)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
Median income^2	4.56e-6	-3.09e-6	8.20e-6	-0.0001**	-4.76e-6	5.25e-6
	(9.06e-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**	0.001**	-0.0001
	(0.0003)	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0002)
% Renters	-2.41e-7	-0.0001	-0.0003	-0.0001	-0.0001	-0.0004+
	(0.0005)	(0.0002)	(0.004)	(0.0002)	(0.0002)	(0.0002)
Precinct located in	-0.034**	-0.020*	-0.022*	-0.030**	-0.021**	-0.017*
Central city	(0.012)	(0.008)	(0.087)	(0.005)	(0.008)	(0.0007)
Distance to CBD	-9.73e-7	0.001+	6.18e-6	0.001*	0.001+	0.001+
	(0.001)	(0.001)	(0.001)	(0.0004)	(0.001)	(0.001)
Constant	3.975	3.898**	3.757**	3.969 **	3.895**	4.077 **
	(0.064)	(0.072)	(0.113)	(0.066)	(0.072)	(0.076)
Observations	6473	6338	6307	6274	6338	6338
R-squared	0.224	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 5. 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	-0.0001	-0.00004	-0.00004	-0.00004
(just – assessed value)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Churn	0.012**	0.011**	0.011**	0.011**
	(0.002)	(0.002)	(0.002)	(0.002)
% with homestead exemption	0.048	0.051	0.035	0.047
	(0.076)	(0.076)	(0.067)	(0.069)
Vote for Al Gore in 2000	-0.211*	-0.203*	-0.206*	-0.228**
	(0.089)	(0.090)	(0.087)	(0.077)
Racial Heterogeneity	-0.177*	-0.202**	-0.180**	-0.144**
(tax jurisdiction)	(0.072)	(0.073)	(0.053)	(0.044)
Racial Dissimilarity		0.0001**	0.001**	0.0004**
(tax jurisdiction)		(0.0001)	(0.0001)	(0.0001)
Share of tax base[1] covered by:				
• Homestead exemption			0.124	-0.107
			(0.130)	(0.103)
• Residential (inclusive of homesteads)				0.516*
				(0.213)
• Commercial				0.457
				(0.293)
• Industrial				0.366
				(0.372)
Constant	4.233**	4.224**	4.187**	3.930**
	(0.106)	(0.107)	(0.115)	(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 6. 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) In-state mobility interaction	(5) Relative mobility	(6)
					Full sample[1]	Restricted sample[1]
Wedge (just – assessed value)	-5.97e-6	-0.00001	-0.0001	-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**	0.235**		
	(0.048)	(0.048)	(0.049)	(0.040)		
Jurisdiction-wide mobility	-0.018	-0.474**	-0.523**	-0.546**		
	(0.095)	(0.100)	(0.105)	(0.102)		
Jurisdiction-wide mobility from outside Florida		0.810**	0.841**	0.837**		
		(0.156)	(0.143)	(0.141)		
Jurisdiction-wide mobility from another Fla. county			0.094	0.564		
			(0.112)	(0.387)		
(Jurisdiction mobility from another Fla. county)*(average wedge in county)				-0.004		
				(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.

"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 5. 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. 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".