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Abstract

The home mortgage interest deduction creates incentives to buy more housing and to become a homeowner, and the case for the deduction rests on social benefits from housing consumption and homeownership. There is little evidence suggesting large externalities from the level of housing consumption, but there appear to be externalities from homeownership. Externalities from living around homeowners are far too small to justify the deduction. Externalities from homeownership are larger, but the home mortgage interest deduction is a particularly poor instrument for encouraging homeownership since it is targeted at the wealthy, who are almost always homeowners. The irrelevance of the deduction is supported by the time series which shows that the ownership subsidy moves with inflation and has changed significantly between 1960 and today, but the homeownership rate has been essentially constant.

I. Introduction

The American subsidy of homeownership is among the most prominent feature of our tax code. In 1999, 773 billion dollars was deducted by 40 million homeowners using the home mortgage interest deduction. After state taxes, it is the most common deduction and ultimately the home mortgage interest deduction stands as one of the most striking and one of the most debated features of the U.S. tax code.

To its detractors, the home mortgage interest deduction is a boondoggle that robs the U.S. treasury and subsidizes America's wealthiest homeowners, the construction industry and quite possibly politically active banks and entities like Fannie Mae and Freddie Mac. To these critics, the deduction stands as glaring evidence for Director's Law— redistribution ultimately goes to the median voter. Moreover, the critics of the deduction argue that it distorts behavior and induces Americans to spend too much on housing. Some analysts, such as Voith (2001), even blame the plight of the inner cities on the housing subsidy.

To its supporters, the home mortgage interest deduction is a cornerstone of American society. Homeownership gives people a stake in society and induces them to care about their neighborhoods and towns. By subsidizing property ownership, the deduction induces people to invest and then to have a stake in our democracy. Ownership makes people vote for long run investments instead of short run transfers. Moreover, home ownership, and perhaps housing consumption itself, seems to be good for the outcomes of children. The deduction may favor the rich, but after all, much of the tax code is progressive and the home mortgage interest deduction just levels the playing field a little.

We believe that there is truth to both of these views. The home mortgage interest deduction, like almost all deductions, disproportionately favors the wealthy. After all, in 2001, more than 50 percent of taxes saved by deductions were saved by the richest decile in America. Furthermore, a rich body of economic research shows how the deduction increases, and possibly distorts, housing consumption.

However, there appear to be externalities both from homeownership and from housing consumption itself. Causal inference is tricky, but homeownership is strongly correlated with political activism and social connection. Homeownership appears to increase home maintenance and gardening. Most tellingly, people seem to be willing to pay more to live around homeowners. Controlling for metropolitan area and for the observable human capital of neighbors, we find that a ten percent increase in the local homeownership rate increases local housing prices by 1.5 percent. While omitted unobservable variables might explain this correlation, the overall body of research seems to confirm positive externalities from homeownership.

While the evidence suggests externalities that might be worth subsidizing, the home mortgage interest deduction does not appear to be an effective means of actually subsidizing ownership. While the deduction appears to increase the amount spent on housing, it appears to have almost no effect on the homeownership rate. The best evidence for this claim is the simple time series shown in Figure 1. Since 1960, the inflation rate has soared and collapsed, causing the subsidy to homeownership to similarly rise and fall (our formula for the subsidy is based on Poterba, 1986). Likewise, as Figure 2 shows, changes in the tax code have caused itemization rates to rise and fall. If the tax code powerfully impacted homeownership, we might expect a relationship between itemization rates and homeownership but as Figure 2 shows, there is no such relationship. Since the 1950s, the homeownership rate has barely budged, staying within a fixed band between 63 and 68 percent. Moreover, the changes in the rate that have occurred seem more related to the suburbanization of the economy than to the subsidy created by the deduction.

This relative invariance of the homeownership rate shouldn't surprise us.

Homeownership is almost perfectly linked with the type of housing structure. People living in single family detached units usually own and people who live in multi-family units rent. As this stock of housing is relatively fixed in the short run, we shouldn't expect much of a response in the homeownership rate to any short run fluctuations. In the long run, though, the power of the home mortgage interest deduction to impact

homeownership is also likely to be small. The groups that are really on the homeownership margin (the poor and the young) rarely use the deduction, even when they are owners. As such, the deduction is unlikely to influence the homeownership rate. The limited impact of the deduction on homeownership means that there is little distortion of the ownership margin due to the home mortgage interest deduction and as such, the deduction serves mainly to increase housing consumption and to change the progressiveness of the tax code.¹

Plan of the Paper

In Section II of this paper, we review basic facts about itemization, the home mortgage interest deduction and homeownership. First, we review the distribution of itemization throughout the population. Itemization, even among homeowners, is extremely rare in the bottom deciles of the population. As a result, the home mortgage interest deduction creates tax savings overwhelmingly for the top deciles of the income distribution.

Second, we review the correlates of homeownership. Homeownership is particularly correlated with housing structure. People who live in multi-unit dwellings rent—people who live in single-family detached houses own. We believe that this stems from agency problems related to home maintenance. Housing structure itself is very highly correlated with age and position in the life cycle. An overwhelmingly large share of non-poor Americans who are married live in single-family houses. Together, these facts mean that the home mortgage interest deduction impacts a subset of the population that almost never rents.

In Section III of the paper, we review the economics of the home mortgage interest deduction. This deduction creates an incentive both to consume more housing and to own.

¹ While some authors attack the deduction because it makes the income tax code less progressive, it is not obvious to us that making the take code more progressive is a good thing.

In Section IV, we consider evidence on possible externalities from housing consumption and home quality, rather than homeownership itself.

In Section V, we turn to the theory behind the social benefits of homeownership. There are three ways that homeownership might create externalities. First, homeowners might take better care of their property and this might create externalities. Second, homeowners, because they own an asset whose value is tied to the quality of their community, might work harder to make their community pleasant. Third, homeowners face higher mobility costs and this might induce them to invest more in their community. We find evidence for all of these channels.

In Section VI, we look at homeownership and neighborhood externalities. First, and most obviously, there is maintenance and gardening. While it sounds trivial, there is little doubt that owners spend more time maintaining their houses and gardens, and panel evidence suggests that this is not just the result of different people being homeowners—people take better care of their houses when they own. This effect appears to create at least 50 percent of any spillovers from homeownership. There is also evidence suggesting that homeowners are more involved in local social groups and are more likely to work to solve local problems.

In this section we also consider the consequences of homeownership for local politics. DiPasquale and Glaeser (1998) showed that homeowners are more likely to vote locally. DiPasquale and Glaeser (1996) and Monroe (2002) showed that municipalities with homeowners are particularly likely to have more spending on schools and streets and less on social welfare and hospitals. Theory predicts that homeowners should favor policies that increase property values in their areas, while renters will tend to favor immediate handouts. As a result, homeowners seem to favor longer-term local investments and through the political process, homeownership may indeed create positive externalities.

There is, however, a dark side to the homeowners' desire to keep property values up. Homeowners, not renters, have been more aggressive in fighting racial integration,

especially in the 1960s and 1970s. More recently, homeowners have spearheaded the movement to limit new housing supply that has artificially inflated housing throughout the U.S. Essentially, as owners have organized they have started to act like local cartels, restricting new entry into the market. This is the downside to having individuals who have incentives to keep price up.

Finally, section VI examines three other possible externalities from homeownership. Homeowners are more likely to vote in national elections and they are more likely to vote Republican. We remain agnostic about whether that creates externalities. Green and White (1998) have shown that the children of homeowners are more successful than the children of renters. The mechanism through which homeownership operates in this instance is not clear, but if society places an extra value on the well-being of children then it may make sense to subsidize homeownership for that reason. Finally, Oswald (1998) argues that there is a homeownership-unemployment link. We find little evidence for this link within the U.S., but we agree that slowing mobility may create problems with the functioning of the labor market.

In Section VII, we attempt to quantify numerically, externalities from increasing housing consumption and homeownership. Our primary approach is to compare the prices of houses that are surrounded by rental and owner-occupied properties. We control for a wide array of housing and neighborhood characteristics and find that prices rise both with neighborhood homeownership and with the quality of the housing stock in the local area.

In Section VIII, we estimate the impact of the home mortgage interest deduction on the homeownership rate. From time series information on the inflation rate, we conclude that this externality is probably small. Cross-state evidence likewise suggests that there is little connection between the size of the subsidy and the level of homeownership. This implies that the efficiency gains from the interest deductions impact on homeownership are likely to be small. Even if the externalities from homeownership are large, the impact

of the deduction seems likely to be sufficiently small that the main consequence of the deduction is redistribution, not changing behavior. Section IX concludes.

II. Basic Facts about Itemization and Housing

Figure 2 shows the path of itemization over time in the United States since 1950. In 1950, only 19.4 percent of Americans itemized. Over the 1950s, this share doubled to 41.1 percent and hit a peak of 47.6 percent in 1970. Responding, presumably, to the Tax Reform Act of 1969, the share of returns that itemized fell to 34.8 percent by 1972. Between 1972 and 1986, the share of returns itemizing rose again to a peak of 39.1 percent in 1986. Since the 1986 Tax Reform Act, the share of returns that itemize has been steady around 30 percent.

Unsurprisingly, the thirty percent of the population that itemizes are distributed disproportionately among the upper income brackets. Table 1 shows the share of itemizers (and the share of total itemized income) by income decile based on information from the 1998 Survey of Consumer Finance. Slightly under one-half of the itemizers are in the top two income deciles. More than 50 percent of the overall itemized income is in the top decile alone. The poorest 40 percent of the population contains only one-tenth of the itemizers, and they are responsible for 3.5 percent of the total itemized income.

Table 1 also shows itemization rates for homeowners and renters by income brackets. As the Table makes clear, among the poorest Americans itemization is very rare for either owners or renters. On average, 12.9 percent of homeowners in the bottom forty percent of the income distribution itemize. On the other hand, almost 50 percent of people in the top decile often itemize whether they are owners or not. These facts are not surprising but they illustrate the extent to which the home mortgage interest deduction is targeted towards wealthier Americans.

But homeownership is high even among the rich who don't itemize. In the top income decile, the share of homeownership, among non-itemizers, is still over 75 percent.

Another way of looking is in Table 2, where we look at the relationship between income and homeownership using the Consumer Finance Survey. In regression (1), we find that the marginal effect of the log of income on the probability of being a homeowner is .19. In regression (2), this coefficient falls to .13 when we control for itemization. Income still strongly determines homeownership. Since itemization is itself a function of homeownership, controlling for itemization is problematic, so these results are merely descriptive. In regression (3), we control for building structure and find that the coefficient on income remains at .13.

As the results in column (3) illustrate, homeownership depends to a considerable degree on taste for structure. To explore this issue further, we split structure type into four categories: single family detached (which represents 59 percent of the housing stock of the United States), single unit attached (which represents 6 percent of housing stock), multi-unit attached (which represents 30 percent of the housing stock) and mobile homes (which represent 5 percent of housing stock). 85.5 percent of people living in single family detached homes are owners and 85.9 percent of people living in multi-family units are renters. People living in mobile homes generally also own (79.6 percent). The only category that is clearly mixed is single family attached homes where 53.2 percent own.

Another way of thinking about this relationship is that correlation between living in a single family detached home (or mobile home) and owning is 58 percent. At the city level the correlation is even higher—73 percent (among cities with more than 50,000 inhabitants in 1990). Figure 3 shows the relationship between owning and living in single family detached houses across cities in the United States with more than 50,000 inhabitants. There are few facts in urban economics as reliable as the fact that people in multi-family units overwhelmingly rent and people in single-family units overwhelmingly own.

The most convincing theory that explains this fact is that the agency problems in home maintenance support having exactly one owner for each building (as suggested by Henderson and Ioannides, 1983 and Kanemoto, 1990). The literature on home

maintenance (DiPasquale and Glaeser, 1999, Shilling, Sirmans and Dombrow, 1991, Butler, 1985, and Galster, 1983) documents that in single-family units, renters take worse care of their homes than owners, and that rental homes depreciate faster. This is unsurprising. Owners face strong incentives to maintain their property. Renters face much weaker incentives. The agency problems involved with renting single-family detached homes (or mobile homes) make it natural for these structures to generally be owner-occupied.

However, the major maintenance problems in multi-unit dwellings are all building, not unit specific. A large structure has one boiler, one roof, and one electrical system. These things are best maintained by a single owner. If each owner is responsible for maintaining these common building attributes, there is a huge free rider problem. As a result, it makes sense for multi-unit dwellings to be rental units with a single owner. While there is no concrete evidence on the management costs involved in cooperative apartment buildings, anecdotal evidence suggests that the agency problems are immense.² Frequently large amounts of tenant time are spent trying to manage these large structures and generally this management rarely seems to be efficient. In general, the maintenance problems appear to be building specific, so agency theory would suggest the simple rule: one building—one owner—and this is what we generally see in the U.S.³

This strong relationship between building structure and ownership means that viewing home ownership solely as a portfolio decision is wrong. The homeownership decision generally involves a simultaneous decision about structure. Subsidizing homeownership will have only modest short-term effects because the building structure is relatively fixed. We think that the connection between ownership and structure type also suggests that subsidizing homeownership may have only modest long-term effects as well, because in

² One treasurer of a New York City cooperative apartment building describes two primary sources of waste. First, cooperative apartment owners lack the specialized expertise needed for large-scale technical problems and complex legal issues. Second, board meetings often devolve into lengthy debates over unclear property rights and get mired in interpersonal conflict.

³ There are substantial cross-national differences in ownership patterns that might lead one to doubt the universal applicability of that rule. Proper analyses of these differences lies beyond the scope of this paper, but we certainly accept the point that large enough policy differences towards housing can indeed turn apartment dwellers into owners or people in single family units into renters.

many cases it would require a very large subsidy to get a well-to-do family of five to live in a multi-unit building. By the same token, multi-unit areas are unlikely to become filled with homeowners. Indeed, the massive distortions of rent control only managed to increase the home ownership rate of New York City—which is filled with multi-family dwellings—to 30 percent. To us, this implies that the ability to shift multi-family units to cooperative or condominium status has limits.

III. Taxes and Housing

The tax treatment of homes potentially changes behavior along two margins: the decision to own or rent and the decision of how much housing to consume. The home mortgage interest deduction both induces individuals to consume more housing and to own the housing that they do consume. In this discussion, we focus on the impact of that deduction, but other aspects of the tax code (and government policy more broadly) also impact the homeownership decision.

For example, there is a rich literature that emphasizes the pro-renter aspects of some areas of the tax code (see, e.g. Gordon, Hines and Summers, 1986). In particular, the accelerated depreciation schedule for landlords tends to support the construction of structures relative to other forms of capital. This feature of the tax code tends to increase consumption of rental housing (just like the home mortgage interest deduction). Unlike, the home mortgage interest deduction it is not as targeted on the wealthier Americans, because accelerated depreciation applies to almost all rental units. This essay will not focus on these issues and will, instead, pay more attention to the home mortgage interest deduction alone.

As there are two distinct margins that are impacted by the home mortgage interest deduction, it makes sense to separate discussion of tax reform into two separate questions. First, should the tax system continue to subsidize the level of housing consumption? Are there social benefits from building bigger homes? Second, should the

tax system continue to subsidize owning relative to renting? Do we want to encourage Americans to have property?

The efficiency arguments for subsidizing either the level of housing consumption or homeownership rely on the existence of externalities. The case against the subsidy focuses on the distortions created by the tax code. Of course, there may also be desirable or undesirable distributional consequences of transferring from renters to owners and transferring from people who consume little housing to people who consume more expensive housing. It is also possible that there are negative externalities associated with either ownership or the level of housing consumption.

The literature on the home mortgage interest deduction is oddly bifurcated. The authors who focus on the costs of the deduction focus entirely on the amount of housing consumed. Aaron (1970), Rosen (1979, 1985), Poterba (1984, 1992) and Mills (1987) are but a small sample of the authors who have looked at the social costs of overconsuming housing due to the home mortgage interest deduction. The authors who look at the possible benefits of the deduction look only at the benefits of ownership. This much smaller literature includes DiPasquale and Glaeser (1998), Green and White (1996), and Rossi and Weber (1992). None of these papers even mentions the possible costs of overconsuming housing.

We begin with a brief formal analysis, following Poterba (1992), on the home mortgage interest deduction and the housing capital gains exemption on the price of housing. To permit this analysis, we look at the impact of tax policy on the steady state cost of housing and we assume (as does Poterba), that the price of housing is rising deterministically with the level of inflation. We let π denote the inflation rate, \bar{i} denote the real interest rate, τ denote the federal income tax rate and τ_p denote the local (deductible) property tax rate. The quantity of housing is denoted H and the price per unit of housing is P_H . We assume that the standard deduction is D .

Our one substantive difference from his model is that we assume that the depreciation and maintenance costs differ for renters and owners. This is meant to capture the agency costs involved in renting, or the problems involved in coordinating multiple owners of a multi-unit dwelling. As such, we denote the total maintenance and depreciation costs as d_R for renters and d_O for owners. Following our previous discussion, we will assume that d_R is greater than d_O for single unit dwellings and d_O is greater than d_R for multi-unit dwellings.

Free entry of landlords (i.e. a zero profit condition) implies that the free market rent for a unit of housing will equal $(\bar{i} + \tau_p + d_R)P_H$ (in after tax dollars). For owners who itemize, the per unit cost of housing will equal $((\bar{i} + \tau_p)(1 - \tau) + d_O - \tau\pi)P_H$. For owners who don't itemize, the per unit cost of housing equals $(\bar{i} + \tau_p + d_O - \tau\theta(\bar{i} + \pi))P_H$, where θ refers to the fraction of the house that is financed with the owners' capital (as opposed to debt). Non-itemizers (as opposed to itemizers) face tax created incentives to put everything into their home, because the capital gains in that asset are not taxed. As such, the home mortgage provides an incentive for owners who don't itemize to invest more in housing (at least relative to renters). This incentive is much higher for individuals who itemize and higher too for individuals who face high tax rates.

One way to think about this incentive, which we will use later, is the percent decrease in the price of housing created by the tax code relative to a non-durable good with a price of one. The percentage reduction in price of owned housing created by the federal tax code

equals $\frac{\tau(\bar{i} + \pi + \tau_p)}{(\bar{i} + \tau_p)(1 - \tau) + d_O - \tau\pi}$. Table 3 shows the value of this reduction for

different parameter values.

If we assume that the real interest rate is two percent, the nominal interest rate is six percent, the local property tax rate is one percent, the depreciation and maintenance cost is three percent (\$3,000 per year on a \$100,000 home) and the federal tax rate is 25 percent, then this number equals 41 percent. If depreciation and maintenance was as high

as five percent, then this number would fall to 28 percent, which is still quite sizable. For non-itemizers, we have financed 80 percent of their house with their own equity; the subsidy equals seven percent of the cost of the home if maintenance is three percent of total costs.

The benefit from owning, as opposed to renting, a house of fixed size equals

$(\bar{i} + \pi + \tau_p)k + d_R - d_O$ per dollar spent on housing if the individual itemizes when he is both an owner and a renter. If the individual only itemizes when he owns, the incentive to own (again per dollar spent on housing) equals $(\bar{i} + \pi + \tau_p)k + d_R - d_O - \tau D / P_H H$. If the individual doesn't itemize in either case, then the incentive to own relative to the cost of housing equals $\tau\theta(\bar{i} + \pi) + d_R - d_O$.

Table 3 shows the magnitude of these three tax-related subsidies values for different parameter values. The tax related subsidies just exclude the depreciation elements from each expression, and they equal $(\bar{i} + \pi + \tau_p)k$, $(\bar{i} + \pi + \tau_p)k - \tau D / P_H H$ and $\tau\theta(\bar{i} + \pi)$ for the three groups. Table 3 shows the value of these subsidies for different parameter values. Poterba (1986) emphasized the powerful effect that inflation has on the incentive to consume more housing—but the incentive that inflation creates to own homes is just as strong. As the table shows, when the inflation rate rises, the subsidy (at least for the itemizers) rises significantly as well. For individuals who don't itemize in either case, the subsidy tends to be small. For example, as the table shows, a less wealthy individual who has financed 80 percent of the value of the house with debt and faces a marginal federal tax of 25 percent, and a nominal interest rate of seven percent, the value of $\tau\theta(\bar{i} + \pi)$ equals .35 percent.

It certainly wouldn't surprise us if the difference between d_R and d_O is two percent (positive for single family dwellings and negative for multi-unit homes). In this case, the depreciation-related incentive to own (or rent) is going to swamp the tax-related benefits of owning for individuals who don't itemize in either case. This may explain why changes in the tax subsidy do not seem to change the homeownership rate.

The tax code creates incentives both to consume more housing and for them to own their homes. These incentives are focused on wealthier people who are likely to itemize. Among non-itemizers, the incentive to own only gets large for those buyers who pay for a significant fraction of their own homes. We will return to the impact of changes in the incentive to own on the homeownership rate, but first we will discuss the incentive to overconsume, which has received a much larger share of academic attention.

IV. Subsidizing Housing Consumption

The case for subsidizing housing consumption is based either on a desire to redistribute income to people who buy a lot of housing or on the desire to encourage people to consume more housing. We have little to say about the good of redistributing to those who consume a lot of housing, so we will focus on the benefits and costs of inducing greater consumption of housing. The usual justification for a subsidy to something like housing is based on claims about externalities, i.e. social benefits from housing which are not internalized by the individuals themselves. By this reasoning, people generally buy too little housing and the home mortgage interest deduction induces them to step up to the plate and consume the size of houses that they should consume if they internalized all of the benefits that more expensive housing creates for society.

There are three main externalities that might come from housing consumption. First, sufficiently poor housing could spread disease and fire. Indeed, throughout most of history, government intervention in the housing market has been motivated mainly by a desire to impose minimum standards on housing so as to stem the flow of infectious diseases and to reduce the threat of widespread urban fires. Second, better housing might create aesthetic amenities which bring pleasure to neighbors and passersby. Third, housing might benefit children. If the government, in general, cares more about children relative to parents, then parents care about children relative to themselves, then there is a case for subsidizing commodities that specifically benefit children.

The first externality is probably at best minimally relevant in 21st century America, at least outside of the poorest areas. Most people are living in well-ventilated, relatively fire resistant homes. Outside of the bottom quartile of society, Americans live in good homes. Moreover fire and safety codes, which are often fairly draconian, appear to be much more effective in limiting the dangers from fire than a blanket home mortgage interest deduction.

Given that health and fire externalities are very rare except among the poorest Americans, the home mortgage interest deduction is poorly designed to correct those externalities. The American Housing Survey also illustrates that wealthier Americans, i.e. Americans in the top half of the income distribution, are unlikely to live in either crowded or dangerous housing. For example, 95 percent of the top 70 percent of the income distribution live in homes with more than 228 square feet per capita. This number may seem small relative to the newer McMansions, but it is higher than the median square footage per capita in London, Paris or Rome, and it certainly is not crowded by any kind of standard. The AHS also tells us that home problems, such as leaks and rats, are very rare among any but the poorest Americans. Indeed, in the entire AHS, more than 40 percent of the housing problems occur in the poorest 25 percent of the population and less than 15 percent of this population itemizes, even if they own. The home mortgage interest deduction doesn't provide incentives for the population groups that are really at risk of consuming substandard housing.

A second externality is aesthetic— perhaps people enjoy looking at fancier homes and as a result people should be induced to consume big houses. In principle, the externality from fancy homes might be either positive or negative. There might be a positive experience from living around nicer homes. On the other hand, particularly fancy homes might incite envy and actually create negative utility. As such, the externality from home quality is theoretically, at least, ambiguous.

One could easily argue that aesthetic externalities are not really a fit subject for federal government policy. After all, aesthetic tastes are quite heterogeneous and it makes little

sense to try to influence these tastes with federal tax policy. Indeed, zoning and land use controls appear to be much more appropriate instruments for internalizing visual externalities. Localities appear to be quite effective (perhaps too much so) at regulating the appearance of their homes.

However, it seems sensible to test whether there is evidence for externalities from housing consumption. If the evidence suggests large externalities, particularly among the rich, then there may be a case for subsidizing the housing consumption of this group through the home mortgage interest deduction.

The standard approach to quantifying these forms of externalities is to see whether people pay more for homes in places where other homes are nicer, i.e. the hedonic approach. In this approach, for each house we estimate:

$$(1) \text{Log(Price)}=a*\text{Attributes}+b*\text{Neighboring Housing Quality}+c*\text{Other Controls},$$

There are several standard problems with hedonic regressions of this form. Measured neighborhood home quality is likely to be correlated with unobserved attributes of the house and neighborhood that also impact the house's value. This correlation is likely to bias our estimates upwards. Moreover, the standard criticisms of hedonic estimation (Epple, 1987) apply as well.

Nonetheless, in Table 4, we proceed with a hedonic estimate of the spillovers from living around nicer homes. We use the neighborhood survey from the American Housing Survey. This survey, done in 1993, is a variant of the standard housing survey with detailed information on housing quality. The advantage of this neighborhood survey is that the AHS gathers information on the 10 closest neighbors. As such, we have information on the characteristics of the neighbors housing (and their own demographics). This can, in principle at least, help us to identify the magnitude of some spillovers.

Housing prices are self-reported and in principle this may create biases. However, Goodman and Ittner (1988) find that generally self-reported housing values overstate true values, but that this overstatement is fairly orthogonal to other features of the house. As such, the bias from self-reported, as opposed to market, values is likely not to confound our results too much.

In all of our regressions, we include a large array of standard house characteristics which are standard in the literature. We are not focused on the value of the coefficients on these attributes, but rather we see them as a control. We also include the average education in the 10 house cluster. This control is meant to control for the average human capital level of community. The estimates in regressions (1)-(3) seem quite sensible and suggest that housing prices increase by slightly more than three percent with each year of schooling in the neighborhood.

In regression (1), we include three measures of average neighborhood housing quality: mean lot size, mean unit size and mean number of housing problems. These averages are based on the housing characteristics of the other nine units in the ten unit cluster. We use a value of zero for the lot size of apartments. The housing problems measure is the American Housing Survey's index measure for capturing the presence of substandard housing. At the house level, each new problem is associated with a nine percent lower housing value.

Both the neighborhood lot size and the unit size coefficients go in the wrong direction—being around bigger homes reduces housing values. We interpret these coefficients as showing the omitted variables problems in these regressions. Presumably, people buy bigger lots in areas which are cheaper and as such we shouldn't be surprised to see the negative coefficient. Only the mean number of problems coefficient goes in the expected direction and it does suggest that houses are cheaper, holding their characteristics constant, if their neighbors have more housing problems. Still, the omitted variables problems continue to make interpreting this coefficient difficult.

In regression (2), we include a composite housing quality measure. We do this by using the hedonic parameters estimating a basic housing hedonic. In order to make averaging sensible, we regress housing price itself (not its logarithm) on housing characteristics. We use these estimated coefficients to create a predicted housing value for each apartment. We take the average of the predicted house value for the other nine houses in the cluster and log that average value to get an elasticity. These results are robust to alternative averaging procedures (i.e. taking the average of a log estimate). We find an overall coefficient of .086, which means that a one percent increase in average housing quality in the neighborhood is associated with an 8.6 percent increase in the value of the house. This coefficient would imply an optimal subsidy of 8.6 percent to the price of housing (which is much less than the subsidy that actually exists for itemizers).

In regression (3), we estimate a spline in this average predicted value parameter. This enables us to check whether the impact of the average value is different for poorer neighborhoods or for richer neighborhoods. We estimate the impact of average predicted housing values with two breaks, corresponding to the 33rd and 66th percentile of the average home price distribution. Surprisingly, the strongest coefficient occurs for the top third of the housing price distribution. There is no effect of housing quality in the bottom third. The coefficient for the middle third is .27 and the coefficient for the top third is .4. In principle, these estimates could justify exactly the subsidy that we see in practice: a generous housing consumption subsidy oriented towards the top of the income distribution. Still, we believe that these results are sufficiently riddled with omitted variables problems that we would be loath to accept them without more proof.

Finally, in regression (4), we use the actual prices of one's neighbors to estimate the average housing quality in the neighborhood. This variable has the advantage of capturing unobserved housing attributes. In other words, if the American Housing Survey does not adequately measure some housing attributes (say, the aesthetic qualities of the house), then these attributes will still be included in the price. However, this variable has the disadvantage of incorporating omitted, neighborhood level characteristics

which would induce a spurious correlation between the dependent housing price and the housing prices of the neighboring houses.

Overall, we find a large impact of the average housing price of the neighbors. The estimated coefficient is .89. In regression (5), we perform the same spline as in regression (4), but here we use actual housing prices instead of predicted housing prices. Just as in that previous regression, we find that the impact of neighborhood housing price is the same at all housing quality levels. We are particularly suspicious about these results because unobserved factors that make houses expensive are likely to affect the entire neighborhood.

Overall, these results suggest that there may well be externalities involved in consuming more housing. Still, the home mortgage interest deduction subsidizes housing consumption beyond the level that would be justified by our preferred estimates in regression (2).

Finally, it is possible that there is an intergenerational externality related to housing consumption. In principle, larger more comfortable homes may benefit children. If the government cares more about children (relative to parents) than parents do, then it may make sense to subsidize homeownership.⁴ We know of no evidence that documents the impact of extra space on the outcomes (or happiness) of children, but we do know that housing consumption and children are clearly complements. On average, the amount of interior spaces rises with 48 square feet per child in the American Housing Survey. This complementarity at least makes it possible that subsidizing housing may yield benefits for children. Of course, in most cases the disadvantaged children that we are most concerned about helping will not be impacted by the home mortgage interest deduction.

The complementarity between housing consumption and children means that the mortgage interest deduction may also have an impact on fertility. If larger homes make

big families possible, then subsidizing housing will be desirable if the government desires to subsidize fertility. Indeed, elsewhere we have shown that there is at least some relationship between fertility and floor area per capita across countries. While this correlation can be due to reverse causality or omitted variables, it is still suggestive and at least raises the possibility that the U.S. government's pro-housing policies may play some role in supporting high American fertility. Of course, this impact on fertility is only desirable if indeed we want to subsidize fertility to begin with, which is far from obvious.

Negative Impacts of Subsidizing Housing Consumption

A wide number of papers have talked about the welfare losses from subsidizing housing consumption in the absence of externalities. These papers have taken the straightforward economic view that distorting consumption creates welfare losses relative to an outcome where prices reflect social costs. However, these losses will get even bigger if there are negative, not positive, externalities from certain types of housing consumption. Here, we briefly mention the possible negative externalities related to subsidizing housing consumption through the home mortgage interest deduction.

Voith (2001) has argued that subsidizing housing consumption may indeed be hurting our inner cities. His argument is that by encouraging more housing consumption, the home mortgage interest deduction encourages people to leave small city apartments to consume larger places on the fringe of the city. This flight from the city might itself impose negative social costs on the people who remain in the city.

More generally, the home mortgage interest deduction may create negative effects by disproportionately encouraging spending on housing among the wealthy, and not the poor. To the extent to which spending is limited to structure, this unequal incentive seems unlikely to cause social problems. However, a significant amount of spending in

⁴ If a parent values his child's utility almost as much as his own, but the government values both equally (even if it doesn't care much about either one of them), then the government should act to create incentives

the expensive areas of the country is spending on land, or community amenities, not on structure (see Glaeser and Gyourko, 2002). As such, the home mortgage interest deduction encourages the rich to spend more on community attributes.

Again, this is not necessarily problematic if community attributes are innate things like access to the seacoast, but it is a problem if the primary community attribute is the average income, or human capital level, of the community. If we encourage the rich to buy more, then we encourage the rich to live in particularly high-income communities. In essence then, the home mortgage interest deduction acts to increase segregation by income. By creating incentives for the rich to spend more on housing, the home mortgage interest deduction creates incentives for the rich to live in fancier neighborhoods, which invariably means that the rich will tend to segregate more.

To make this concrete, consider the following simple algebraic example. Consider a world with N rich people and N poor people living in two communities each of size N . All houses are identical, except that people get utility from the percentage of rich people in the community equal to $a*r$, where r is the percentage of the community that is rich and a is an individual specific parameter that is restricted on the interval $[\alpha_R - \varepsilon, \alpha_R + \varepsilon]$ for the rich and $[\alpha_P - \varepsilon, \alpha_P + \varepsilon]$ for the poor, where $\alpha_R > \alpha_P$. The equilibrium condition for this model is that the difference in housing prices between the two neighborhoods must exactly offset the utility gains from being in a neighborhood with more rich people. In the absence of subsidized housing, there will be one rich

community with a proportion of rich residents equal to $.5 + \frac{\alpha_R - \alpha_P}{4\varepsilon}$, and a poor

community with a proportion of its residents that are poor that this is equal to

$$.5 - \frac{\alpha_R - \alpha_P}{4\varepsilon}.$$

If the tax code subsidizes housing consumption for the rich (and not the poor) so that they only pay $1-s$ of any housing costs, then in the new equilibrium the rich community will

for transfers from parent to child.

have a proportion of rich residents equal to $.5 + \frac{\alpha_R - (1-s)\alpha_P}{2(2-s)\epsilon}$ and the poor community

will have a proportion of rich residents equal to $.5 - \frac{\alpha_R - (1-s)\alpha_P}{2(2-s)\epsilon}$. The degree of

segregation (i.e. the share of the rich who live in the rich community) rises with the degree of subsidization. As such, any policy that makes it cheaper for the rich (relative to the poor) to live in the more expensive neighborhood will tend to increase the degree of segregation in society. Conversely, a policy that disproportionately subsidizes the housing consumption of the poor (perhaps Section VIII vouchers) would act to decrease income segregation.⁵

Cutler and Glaeser (1997) argue that black-white segregation is quite harmful to African-Americans. If subsidizing housing consumption abets this segregation, then it will create negative externalities for African-Americans. Since we do not have meaningful estimates of the impact of the subsidy on the level of segregation, it is impossible at this time to calculate the welfare costs from this aspect of housing subsidy. Still, we highlight this potential negative impact of the home mortgage interest deduction as a topic for future research.

V. The Externalities from Ownership

We now switch from considering the housing consumption margin to considering the ownership margin. The bulk of the discussion about the benefits of the home mortgage interest deduction has focused on this margin and the externalities from homeownership. At this point, we first address the question of whether there are externalities from homeownership and if so, how important are they. Then, we turn to the question of whether the home mortgage interest deduction does a good job of promoting homeownership.

⁵ Indeed, Katz, Kling and Leibman (2001) find that voucher recipients tend to use their vouchers to move to low poverty neighborhoods, even when there is nothing explicit about the voucher that subsidizes non-poor neighborhoods.

The economics literature points to three reasons why homeownership might create externalities. First, homeowners own an asset whose value is tied to the strength of their community. As such, they have an incentive to act (and vote) for things which will make their community more attractive. This may take the form of community activism or contributions to public goods. Of course, free rider problems still exist, but the property stake in the community creates at least a small incentive to keep the community strong.

This becomes particularly clear in the case of elections. Homeowners will tend to prefer government actions that keep the value of their property. In many cases, these actions may be long-term investments that raise the long-term prospects of the community. As housing is a long-lived asset, it will incorporate expectations about the results of government investment and owners will reap benefits from long-term government incentives.

Conversely, renters have no financial stake in strengthening the community and because rents are not fixed, they can even lose from investments that strengthen the community. If these investments are sufficiently attractive to outsiders, then they will raise rents more than they raise the utility of the renters directly and the renters may lose. As such, renters will be likely to prefer direct government handouts that come to them, while owners will be more likely to trade off such handouts for investments in the community (the algebra of this argument is given in DiPasquale and Glaeser, 1996).

There is also a dark side to the political interests of homeowners. Owners face incentives to raise house prices by any means possible. In some cases, improving the community is a natural means of raising prices. In other cases, stopping off new supply of housing is a more effective means of raising prices. As such, homeowners will be likely to act like local monopolists and try to cut off new supply.

The second reason why homeownership creates externalities is that it creates barriers to mobility. There are few economic assets with transaction costs that are big as those involved in home sales. Real estate agents that typically charge between three and six

percent of the value of the house are not uncommon, and both sellers and buyers bear other costs as well. These costs mean that homeowners move much less often than renters do. Indeed, the 2000 Current Population Survey tells us that 32.5 percent of renters changed houses in the previous year, while only 9.1 percent of owners changed houses over the same period.

These costs become exacerbated in down markets where the leverage created by mortgages means that owners have frequently lost most of their equity. As a result, they may have lost their ability to make a down payment elsewhere and they find themselves fixed (this argument is made by Stein, 1998). As we will discuss later, this permanence, particularly in declining areas, may be harmful as people become trapped in high unemployment areas. Still, there may also be benefits from permanence.

The incentive to invest in a community and in social connections will depend on one's time horizon. Individuals who only expect to live in an area for a few months are unlikely to both make friends and join local organizations. People who are fixed have much more to gain from connecting with others. Likewise long time horizons will increase the returns to becoming informed about local issues. They will reap the returns from these investments over time. If investment in social connections yields externalities, then this permanence will create positive externalities.

The third possible way in which homeownership might generate externalities is through home maintenance and gardening. Homeowners face incentives to take better care of their homes than renters. If some of this care creates aesthetic externalities then homeownership may yield benefits through greater care. Of course, for this externality to be important it must be the case that landlords take worse care of their homes than homeowners.

There are two approaches to measuring the externalities from homeownership. The first, and most direct way, is to examine an activity that is believed to yield externalities, for

example gardening or joining clubs, and to see whether homeowners do more of this activity than renters. In other words, to run a regression of the form:

$$(2) \text{ Outcome} = a + b * \text{Homeownership} + c * \text{Other Controls}$$

This approach is taken by Rossi and Weber (1996), Green and White (1996) and DiPasquale and Glaeser (1998). In some cases, it may make sense to examine community level aggregates of this activity and to see if it is correlated with the community level homeownership rate:

$$(3) \text{ Average Outcome} = a + b * \text{Homeownership Rate} + c * \text{Other Controls}$$

The biggest problem with this approach is that homeowners differ from renters along different dimensions. Indeed, as Section II emphasized homeowners are likely to be older and richer. Of course, multivariate regressions can control for observable characteristics that are correlated with homeownership. More problematic are the characteristics (e.g. responsibility or patience) that are likely to both generate homeownership and influence socially beneficial activities. The biases created by omitted variables are likely to be severe and make pretty much all estimation of this type somewhat dubious.

There are two common approaches to this type of problem. In some cases it may be possible to use longitudinal data and look at how people change their behavior when they become homeowners. This approach at least eliminates any time-invariant individual characteristics that are likely to be correlated with homeownership. Unfortunately, this approach cannot deal with time varying individual heterogeneity, and this form of heterogeneity is likely to be important. If we see someone become more responsible when he buys a home, is it the result of the home, or has the individual just grown up a little and gotten his act together? Still, we believe that longitudinal data is ultimately the best approach to this problem. However, the only use of longitudinal data in this area was done on German data by DiPasquale and Glaeser (1998) and yielded, at best, mixed results.

The reason why longitudinal data is so desirable is that the alternative identification strategy, the instrumental variables approach, seems unlikely to yield convincing result. The instrumental variables approach would rely on some natural experiment that increased the homeownership rate and didn't have any other correlation with the relevant outcome. Past attempts at instrumental variables approaches include Green and White's (1997) use of the ratio between rental prices and housing costs. While this is certainly a valiant try, this ratio is not exogenous and seems likely to be both correlated with and potentially caused by a large number of area level characteristics which are likely to be correlated with outcomes of interest. Likewise, DiPasquale and Glaeser (1998) use statewide variation in the homeownership rate for different demographic subgroups. Again, this attempt suggests more courage than wisdom, as these aggregate rates are unlikely to satisfy the relevant orthogonality condition.

There are several reasons why successful instrumental variables strategies have been elusive. Location-level attributes that influence homeownership, such as the housing stock, are likely to have a direct impact on the many outcomes. The share of the housing stock that is detached explains most of the variation in the homeownership rate across cities. Since this housing stock variable is highly correlated with the entire spatial structure of the city, it is very likely to have a direct effect on most outcomes of interest.

Second, if an exogenous attribute makes homeownership cheaper, then it will attract people who are inclined towards homeownership. This migration effect is potentially quite serious. Consider two locales, one of which subsidizes homeownership and the other of which doesn't. In principle, this subsidy should be a clean experiment showing the effect of homeownership. However, people who are prone to own homes will move into one place and rent-prone individuals will move into the other locale. As such, the differences across the communities are quite likely to be caused by omitted individual characteristics of the migrants.

If there is a change in policy, and we believe that this change moves the homeownership rate faster than it influences migration, then in principle we might be able to use the changes in the locale's outcome as a test of the effect of homeownership. Monroe (2001) represents the best work of this nature. Monroe looks at branch banking at the state level and finds that when states allowed branch banking, their homeownership rate increased. Unfortunately, the changes in the state homeownership level tended to be too small to identify the impact of homeownership with any precision.

Ideally, there would be some sort of government policy that is specific to the individual, not the locale. By comparing individuals who had access to the policy with identical individuals who didn't, we might be able to test for the impact of homeownership. Of course, such a policy would need to be free of other effects, and in particular free of an independent income effect. In practice, most pro-homeownership policies have tended to also transfer large amounts of wealth to treatment group. As a result, any effects represent the combined impact of homeownership and greater wealth.

The second approach to measuring the externalities from homeownership is indirect. Instead of seeing whether homeowners differ from renters, we test the impact of living around homeownership on housing prices. In other words, we estimate a variant of regression (1):

$$(4) \text{Log}(\text{Price}) = a * \text{House Attributes} + b * \text{Neighborhood Homeownership Rate} + c * \text{Other Controls}$$

This approach asks whether housing prices are higher in neighborhoods where other people own homes. This approach is obviously also problematic. The neighborhood homeownership rate is likely to be correlated with other neighborhood attributes, such as low housing costs (which would bias the estimate of "b" downward) or attractive neighborhood amenities (which would test to bias the estimate of "b" upwards).

Still, in principle we can try to control for location specific amenities. The primary advantage of this approach is that it gives us an actual dollar estimate for the value of homeownership. We believe that this approach actually makes more sense at the local level where patterns of homeownership may be somewhat random, than at the city level where high levels of homeownership are almost completely determined by the housing stock, which is itself so important in driving prices. We will turn to this approach later when we try to put an actual dollar value of the externalities from homeownership.

VI. Evidence on the Externalities from Homeownership

We now discuss the evidence on homeownership and a number of potentially externality creating activities. First, we discuss the homeownership and home maintenance and gardening. While this is in a sense the most mundane connection, it is also the strongest. We then discuss the connection between homeownership and social connections. We then turn to the connection between homeownership and political behavior. We end this section by discussing other externalities potentially related to homeownership.

Homeownership, Maintenance and Gardening

Home maintenance and gardening may be mundane, but these activities are likely to lead to a more pleasant neighborhood and generate externalities. In Section IV, above, we already found the neighborhood home values rise with housing quality. The attention that homeowners' groups pay to enforcing local rules at housing and garden maintenance also provides anecdotal information supporting the existence of externalities from these activities.

There is a rich body of evidence on the connection between homeownership and home maintenance. Authors like Galster (1983) and DiPasquale and Glaeser (1998) have shown that homeowners are more likely to engage in home maintenance and gardening. DiPasquale and Glaeser (1998) find that the homeownership effect on housing repairs even survives in longitudinal data with individual fixed effects. Shilling, Sirmans and

Dombrow (1991) show that the rate at which property depreciates is a function of homeownership. If we believe the estimates above, which suggest that the value of a home is a function of the average quality of homes in the neighborhood, then these home maintenance effects will end up increasing the value of homes in the area.

The raw correlation between homeownership and gardening or doing housework is quite large. If we consider only people who live in single family detached homes, 73.4 percent of owners garden and 49.5 percent of renters garden in the General Social Survey. DiPasquale and Glaeser (1998) report that in their German Sample 33 percent of renters report doing home repair or yard work and 57 percent of owners report doing the same activities. This difference, in the German data, drops in half with individual fixed effects, which means that there is still a 10 percent difference in the rate at which people do this home maintenance.

The net effect of these maintenance differentials is that homeowners live in considerably less dilapidated surroundings than renters. In the American Housing Survey, among the set of owner-occupied single family detached homes, 3.1 percent have open cracks or holes in the wall or ceiling. The comparable number for rented single family detached homes is 10.2 percent. Likewise, 2.8 percent of owner-occupied homes have broken plaster or peeling paint and 1.7 percent have signs of rats or mice. The comparable numbers for rented units are 7.5 percent and 5.4 percent respectively. It is hard to know the extent to which these differences reflect intrinsic differences of the units or the residents that are unrelated to homeownership. Still, the gaps are striking enough that they add some credibility to the view that homeowners just take better care of their property. When we turn to the hedonic estimates, we will be able to control for housing quality, which will give us an estimate of the extent to which the externalities from homeownership work through better home maintenance.

Homeownership and Social Capital

The evidence for social groups and homeowners likewise consists primarily of large correlations without any strong evidence for causality. Table 5 shows the membership patterns of owners and renters in the General Social Survey. In every form of group membership, owners are more likely to join the renters. At the bottom of the table, we look at two aggregate measures: the two number of types of organizations to which the individual belongs and the frequency with which the individual socializes with his or her neighbors. For both of these variables, homeowners are also more social.

The third column shows the marginal effect estimated in a probit regression where we control for age, age squared, education level, income level (and a dummy variable for cases where income is missing), marital status, gender, race, and living in a single family detached home. Many of these differences become insignificant once we control for other individual attributes, but all but two remain positive. The variable that aggregates group membership remains quite significant, but the socialization variable does not.

The endogeneity of homeownership remains worrying and it is certainly possible that the correlation between homeownership and group membership stems mainly from unobserved variables which make people more likely to be homeowners and make them more likely to join groups. One possible approach to this is to an instrument which increases homeownership and does not have a direct impact on group members. In Table 6, we use the share of the metropolitan area that lives in single family detached housing in 1980 as an instrument for homeownership. As we discussed above, this variable is strongly correlated with homeownership. This element of the housing stock is reasonably exogenous. The main problem with it as an instrument is that people may select across metropolitan areas and as such there may be a correlation, through this migration, between the variable and unobserved individual heterogeneity.

Nevertheless, we proceed using this variable as an instrument for homeownership in the organizations regression. We find that, after controlling for observable characteristics, the coefficient on homeownership remains large (indeed it grows) but becomes statistically insignificant. Overall, we find these results provocative but far from

compelling. There is clearly a correlation between homeownership and group membership, but at this stage we cannot be sure of a large, causal link.

Politics and Homeownership

A second channel through which homeownership might create externalities is the political process. Homeownership should give people more incentive to be involved politically. It may also get them to make political choices that favor the long run health of their community (which will create higher housing prices). Conversely, as DiPasquale and Glaeser (1998) show, renters have an incentive to favor policies which bring immediate benefits relative to long run gains.

In Table 7, we use data from the General Social Survey to show the connection between homeownership and a number of political variables. The first two rows show that homeowners are more likely to be informed about political figures. The first row shows that 36.8 percent of homeowners know the name of the local school board head and 22.2 percent of renters have the same knowledge. This effect isn't just the result of homeowners having children. When we control for a wide array of background characteristics, the gap between owners and renters remains large and significant.

In the second row, we show that 22.1 percent of renters know the name of their U.S. representative and 43.2 percent of owners have that knowledge. This gap drops in half when we control for other characteristics, but the difference remains significant. There does appear to be a significant difference in political knowledge associated with home owning.

52.4 percent of renters report that they have voted in local elections. 76.5 percent of homeowners report that they have voted in local elections. When we include our other controls, this difference drops to 10.75 percent, which is still quite significant. DiPasquale and Glaeser (1998) found that this effect does not decline when they control for years of residence in the community. As usual, we cannot be sure that

homeownership isn't proxying for other omitted characteristics. Still, there appears to be significant evidence for the hypothesis that homeowners are more politically involved in local affairs.

We also look at the connection between homeownership and people saying that they have worked to solve local problems. This variable is self-reported and hard to interpret. Still, the difference between homeowners and renters is striking. 39 percent of owners say that they have worked to solve local problems. 24.6 percent of renters make the same claim. This gap falls to 9.3 percent once we control for other attributes. Certainly, this presents some evidence supporting the view that ownership creates incentives to improve the neighborhood.

Another approach to this issue is to look at the association between local government spending patterns and homeownership. While we do not have actual voting records across communities, we do have local public finance variables from the City and County Data Book. These variables are difficult to interpret because they represent only spending by the locality itself. Thus, if the locality is in a state that generally takes responsibility for a larger share of certain types of spending, this will influence our variables. We try to correct for this problem by including state fixed effects. We also control for income, age, education and density in the locality. With these controls, we find the following two results for data in 1990:

$$(5) \text{Log(Per Capita Expenditures)} = -.026 * \text{Homeownership Rate}$$

and

$$(6) \text{Log(Percent of Spending on Welfare)} = -0.019 * \text{Homeownership Rate}.$$

The standard error on the homeownership coefficient in the first regression is .005 and the standard error in the second regression is .004. The number of observations in both

regressions is 1076. We also found the homeownership reduces the share of spending on health and hospitals and increases spending on highways.

While these results are certainly open to debate, they suggest that homeownership is associated with lower per capita spending and less spending on transfers. The interpretation of this is that homeowners may work harder to keep taxes down and to avoid transfers, which do not build long run property values. While these effects of homeownership are not unambiguously positive, they do support the hypothesis that homeownership alters the political behavior of people.

Just as homeowners face incentives to invest in their communities, they also face incentives to restrict supply of new housing in order to raise prices. Through zoning and other land use controls, economics predicts that homeowners will work hard to ensure that no substitutes for their houses are brought on the market. This attempt to restrict supply will impose costs on people who want to live in the area and should be seen as a negative consequence of homeownership.

To show the impact of homeownership on the desire for zoning, we looked at all local voting measures submitted to referenda in California in 2000. A typical such measure was a San Francisco referendum on the following question:

Shall the rules that govern converting rental housing to condominiums also apply to converting rental housing to certain forms of joint ownership with exclusive rights of occupancy, and shall the annual 200-unit cap on such conversions be made permanent?

Other measures similarly restricted new owner-occupied housing or made it easier for communities to do so.

The relationship across voting units between homeownership and support for the measures is shown in Figure 4. The underlying regression is:

(6) Percent Pro-Zoning=19.2 + .5*Homeownership, N=30, R-Squared=.197
(.12) (.2)

Standard errors are in parentheses. The positive effects of homeownership on local quality should be weighed against its negative effect on restricting the supply of new construction.

Other Externalities: Voting, Children and Unemployment

Another possible externality that may be related to homeownership is investment in children. Recent research by Green and White (1997) has shown that children of homeowners are about 25 percent less likely to drop out of school than children of comparable renters. This effect is strikingly large in magnitude and quite robust across specifications and across data sets. Green and White (1997) show that this holds in the Panel Study of Income Dynamics, the High School and Beyond Survey and the Current Population Survey.

Of course, as discussed above, the natural objection to this research is that homeownership is endogenous and likely to be correlated with other parental characteristics that may well create good outcomes for children. For example, more future-oriented parents may both be more likely to save to buy homes and be more likely to invest in their children. As such, this effect may well be the result of spurious correlation (just as the results of DiPasquale and Glaeser, 1998, might be). Also, the theoretical grounds for believing in this connection are not obvious. Perhaps the permanence and community investment created by homeowners helps kids, but it isn't clear why this should be the case.

Green and White (1997) are well aware of this problem and try to address it using a measure of relative housing cost, which reflects the ratio of housing prices to local rents. Using this measure as an instrument, they still find significant effects of homeownership on the dropout rate. Of course, one could also argue that these variables are themselves

also likely to be correlated with omitted characteristics related to the outcomes of children. Still, the fact is striking and certainly worthy of more research.

As we discussed above, there exists an externality related to the raising of children, if the government cares more about the children relative to parents, and if parents care about children relative to themselves. As such, the positive effects of homeownership on children may end up being the best argument for subsidizing homeownership, if indeed these effects are found to be causal. Given the importance and ambiguities surrounding the Green and White results, it seems clear that this question needs further research.

A final set of externalities connected to homeownership might work through the unemployment rate. In some very highly publicized research, Oswald (1998) has argued that high homeownership rates lead to high levels of unemployment. He shows across regions in Europe that homeownership and unemployment have tended to go together. His argument is that homeownership creates barriers to mobility and that these barriers stop workers from moving in response to labor market shock. In areas with renters, people can move quickly in response to a shock. In areas with owners, the owners are fixed.

We think that there are three issues with this line of research. First, Glaeser and Gyourko (2001) argue that durable housing means that the overall housing stock is fixed, even if the residents are renters. As such, population levels tend to decline only very slowly in response to negative labor supply shocks, even when the population is made up of renters. This means that in a world of renters, there is not an easy adjustment to a local downturn. Renting only makes it easy for one group of residents to flee and be replaced by another group of residents. Glaeser and Gyourko (2001) claim that this fixed nature of houses helps us to understand why low human capital people sort into declining cities. If there are huge welfare gains from this sorting, then renting is beneficial, but there needs to be gains from sorting, not just gains from emigration.

Second, empirically the case for a homeownership-unemployment connection in the U.S. seems quite weak. For example, across U.S. cities the correlation between homeownership and unemployment is -42 percent. This negative relationship remains when we control for per capita income and human capital variables. Far from increasing unemployment, homeownership appears to be negatively correlated with unemployment. We certainly wouldn't interpret this causally, and we certainly believe that omitted variables are likely to explain this relationship. Still, the negative relationship does push us away from believing the Oswald hypothesis.

Third, the negative effect of homeownership on mobility is not itself evidence of any sort of externalities, even if it leads to unemployment. Housing economists have long emphasized the fixed costs involved in buying a house and that homeownership increases mobility costs. In general, these higher costs will be internalized by the homeowner. It is only if there are externalities related to unemployment, perhaps through the tax structure and unemployment benefits, that a correlation between unemployment and homeownership creates a case for taxing (as opposed to subsidizing) homeownership.

VII. Hedonic Estimates of the Externalities from Homeownership

On net, there is substantial evidence suggesting that homeowners take better care of their homes and that they are also more likely to join in social groups. Does any of this matter? Do these activities increase the willingness of neighbors to pay for proximity to homeowners? To answer this question we turn again to the neighborhood module from the American Housing Survey. As discussed above, we use the average homeownership rate in the neighborhood as our key variable and we control for (1) the average level of neighborhood human capital, (2) the average predicted housing value of neighboring houses describe above and (3) the usual collection of individual house characteristics.

We report our basic results in regression (1) of Table 8. We find that a 10 percent increase in the local homeownership rate is associated with a 2.5 percent increase in housing values. This result echoes the much more sophisticated findings of Coulson,

Hwang and Imai (2002) who also use this sample to document positive spillovers from homeownership. They, however, use a selection model that actually attempts to deal with sorting across communities.

In regression (2), we test the hypothesis that the effect of homeownership is mainly due to home maintenance by controlling for the average number of housing problems in the neighborhood. When we include this control, the coefficient on homeownership falls in half and becomes only marginally significant. One natural interpretation of this regression is that a large part of the benefits from local homeownership comes from better housing maintenance.

Finally, in regression (3), we include a control for share of houses that are single-family detached dwellings. This variable has a negative impact on housing prices, presumably because people are more likely to build multi-unit dwellings in areas where land costs are high. When we control for this variable, we find that the coefficient on the average homeownership rate doubles. Now a ten percent increase in the neighborhood homeownership rate is associated with a 4.7 percent increase in housing values.

In regressions (4)-(6), we repeat regressions (1)-(3) but include metropolitan area fixed-effects to account for any cross-city heterogeneity. The results are smaller and less precisely estimated, but are generally still significant.

A final piece of evidence on the impact of homeowners on localities is their impact on local growth. In past work (e.g. Glaeser et al., 1995), one of us has used city growth regressions as a means of testing whether a particular attribute is good for a city. Thus, the generally strong positive relationship between local schooling levels and local growth has been interpreted as evidence that local human capital is an engine of local innovation and growth. As such, it makes sense to check whether homeownership is positively related to local growth.

In Figure 5, we show the positive relationship between homeownership and population growth at the city level between 1990 and 2000 for cities with more than 50,000 inhabitants. The underlying regression is:

$$(7) \text{ Population Growth} = -.024 + .22 * \text{Homeownership Rate}, N=503, R\text{-Squared}=.03. \\ (.03) (.05)$$

Standard errors are in parentheses. The relationship is certainly not overwhelming, but it does indicate the cities with more homeownership have done well at attracting further residents over the past decade. Certainly, none of this evidence conclusively shows that there are positive jurisdictional spillovers from homeownership, but it does, at least, leave the matter open.

VIII. Does the Home Mortgage Interest Deduction Promote Homeownership?

In the previous three sections, we have discussed the evidence on the presence of externalities from homeownership. We believe that this evidence is weak but suggestive. However, any evaluation of the home mortgage interest deduction and homeownership should also ask the question: does the deduction have any impact on homeownership at all? Because homeownership is so closely tied to structure type and because the groups that appear to be most likely to be on the margin between renting and owning don't itemize in either case, it seems reasonably likely that the home mortgage interest deduction ends up having a very small impact on the overall homeownership rate. In this section, we marshal some evidence on the connection between the deduction and the homeownership rate.

Our first pieces of evidence use the time series over the past 40 years. We know from Section III, that the ownership subsidy created by the tax code is $(\bar{i} + \pi + \tau_p) \tau$ per dollar spent on housing if the individual itemizes when he is both an owner and a renter, $(\bar{i} + \pi + \tau_p) \tau - \tau D / P_H H$ if he only itemizes when he owns and $\tau \theta (\bar{i} + \pi)$ if he doesn't itemize in either case. In all cases, the subsidy is roughly proportional to the nominal

interest. Thus, a doubling of the nominal interest rate will cause the subsidy to roughly double (since the nominal interest rate is several times as large as the property tax rate).

Of course, the nominal interest rate also causes the price of housing to rise. As such, a better test of the importance of the subsidy is to see whether changes in inflation cause the homeownership rate to rise. In a world without the deduction, changes in inflation should not really impact the level of homeownership. After all, as Poterba (1986) documents the real cost of funds is relatively independent of inflation. The one clear impact of the level of inflation is that it increases the tax-created subsidy for owning a home.

A second time series test of the importance of the homeownership rate is the role of itemization. Clearly, as the level of itemization increases (for reasons other than homeownership), the subsidy to homeownership should go up. Likewise, if the government increases the standard deduction in an attempt to simplify the tax code and reduce itemization, then homeownership should fall, if the tax subsidy is at all important. Thus, our second time series test of the importance of the home mortgage interest deduction is to see whether changes in the degree of itemization cause the level of homeownership to increase. Of course, there is a natural spurious positive correlation that comes about because homeowners are more likely to itemize than renters, thus the coefficient will tend to be an overestimate of the true coefficient.

Table 10 shows our results. Using quarterly data since 1971, regression (1) shows the relationship between the subsidy rate and the level of homeownership. Increases in subsidy cause the homeownership rate to increase, but the effect is slight and insignificant. A one percent increase in the subsidy rate causes homeownership to rise by .0009 percent. In regression (2), we show that this result remains unchanged when we control for the conventional mortgage interest rate (which has its predicted negative sign). Regression (3) includes demographic controls following Rosen and Rosen (1980).

In regression (4) we look at itemization. In this case, there is a significant negative relationship, which goes in the wrong direction. This coefficient becomes insignificant when we control for the conventional mortgage interest rate. The basic story of these regressions is shown by Figures 1 and 2. Over the past 40 years, the inflation rate and the share of people who itemize have both had major ups and downs. The homeownership rate has been extraordinarily flat and the immobility of the homeownership rate serves as evidence on the weak connection between the home mortgage interest deduction and the level of homeownership.

To further explore this relationship, we look at cross state data within the United States. Using the National Bureau of Economic Research's Taxism database, we use the extent to which the mortgage interest subsidy differs by state. This subsidy represents the marginal subsidy to mortgage interest of an average taxpayer in the state as described by Feenberg and Coutts (1993).

Figure 8 shows the cross state variation in the degree of mortgage subsidy and its relationship to the homeownership rate. Places with a bigger subsidy tend to have slightly lower homeownership rates, but there is essentially no relationship. Figure 9 shows the relationship between changes in the degree of mortgage subsidy and changes in the homeownership rate between 1990 and 2000. Again, there is essentially no relationship. This data further confirms our basic point: the home mortgage interest deduction doesn't have much to do with the homeownership rate.

IX. Conclusion

We have argued that there is a limited body of evidence suggesting that homeownership creates positive spillovers for near neighbors. Homeowners do appear to be more active citizens. They vote more. They take better care of their homes. Houses that are surrounded by homeowners are worth a little more than houses that are surrounded by renters. There are also negative aspects to homeownership. Homeowners respond more slowly to labor market shocks and they vote to constrict new housing supply. Still, there

is enough evidence to support the view that pro-homeownership policies are at least possibly beneficial.

However, the home mortgage interest deduction is really not a pro-homeownership policy in any meaningful sense. It subsidizes housing consumption, but its impact on the homeownership rate appears to be minimal. This seems to occur because homeownership is strongly determined by choice of structure type, i.e. living in a single family detached home, and because the poorer people who are on the homeownership margin generally don't itemize, even if they own. Our best evidence on the irrelevance of the deduction to the homeownership rate is that over the past 40 years as the deduction's implicit subsidy has soared and crashed, homeownership has barely budged.

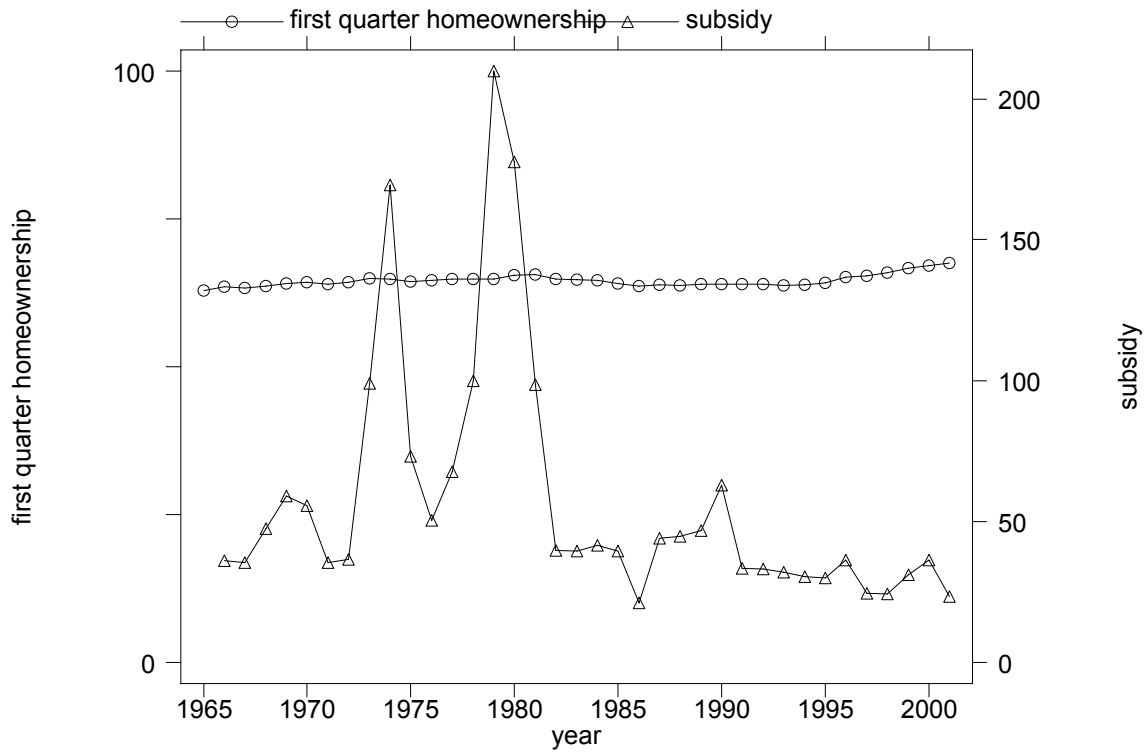
As such, the home mortgage interest deduction needs to be judged on other grounds. Is it desirable as a means of making the income tax schedule less progressive? Is it desirable as a subsidy to housing consumption? The home mortgage interest deduction may or may not make sense, but it does not have a major impact on the homeownership rate and the externalities from homeownership (if they exist) cannot be used as a justification for the deduction. Instead, other government policies, particularly those which reduce the down payment levels for poorer Americans, are a much more effective means of influencing the level of homeownership.

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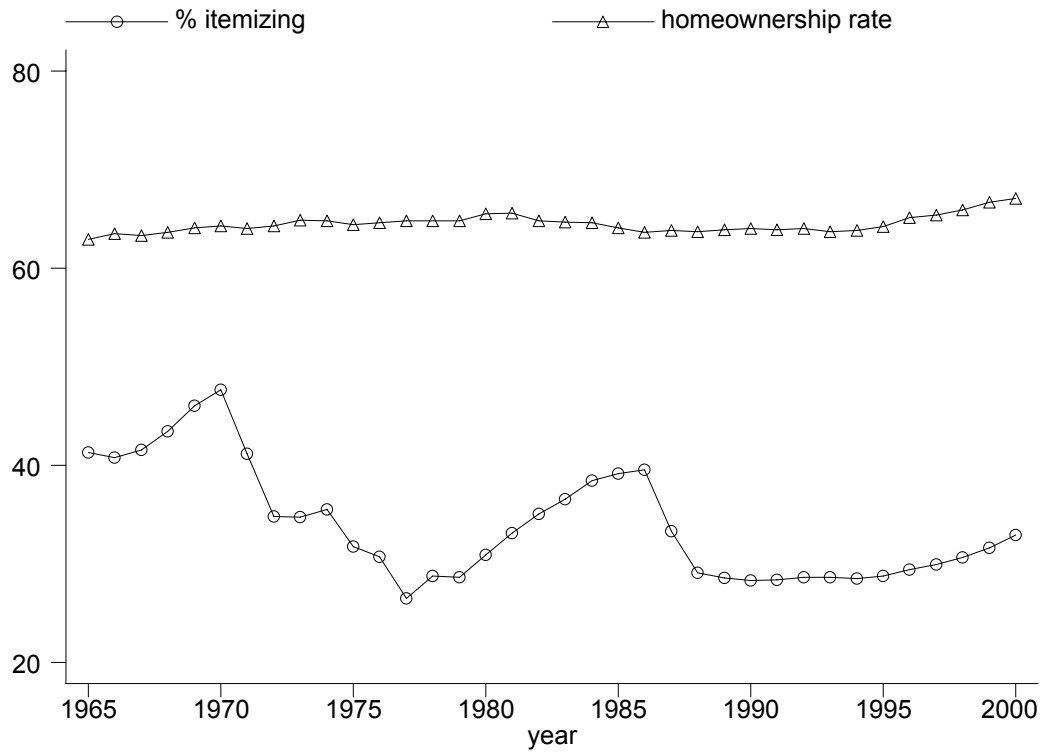
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Figure 1: Homeownership and inflation, 1965-2000



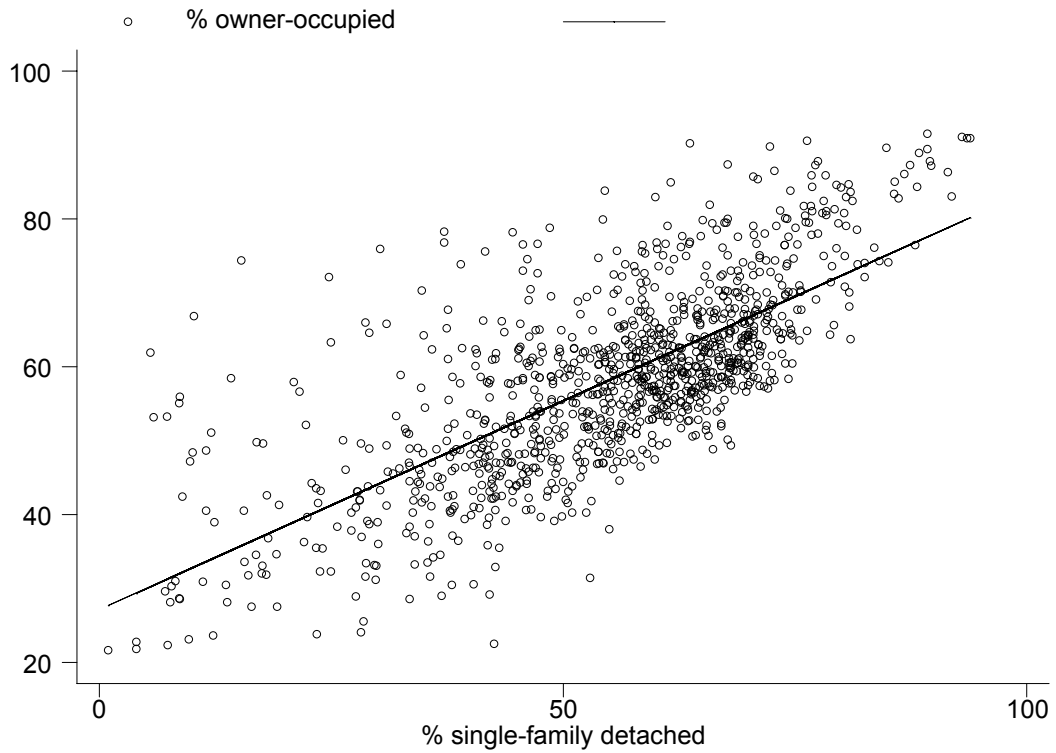
Notes: Subsidy series shows the effect of federal taxes on the price of owner-occupied housing, based on the twelve-month CPI inflation rate prior to the first quarter of each year. Data from www.freelunch.com. See Section III for a discussion of the calculation of the subsidy. Homeownership rate is estimated rate for first quarter of each year. Data from www.census.gov.

Figure 2: Trends in itemization, 1965-2000



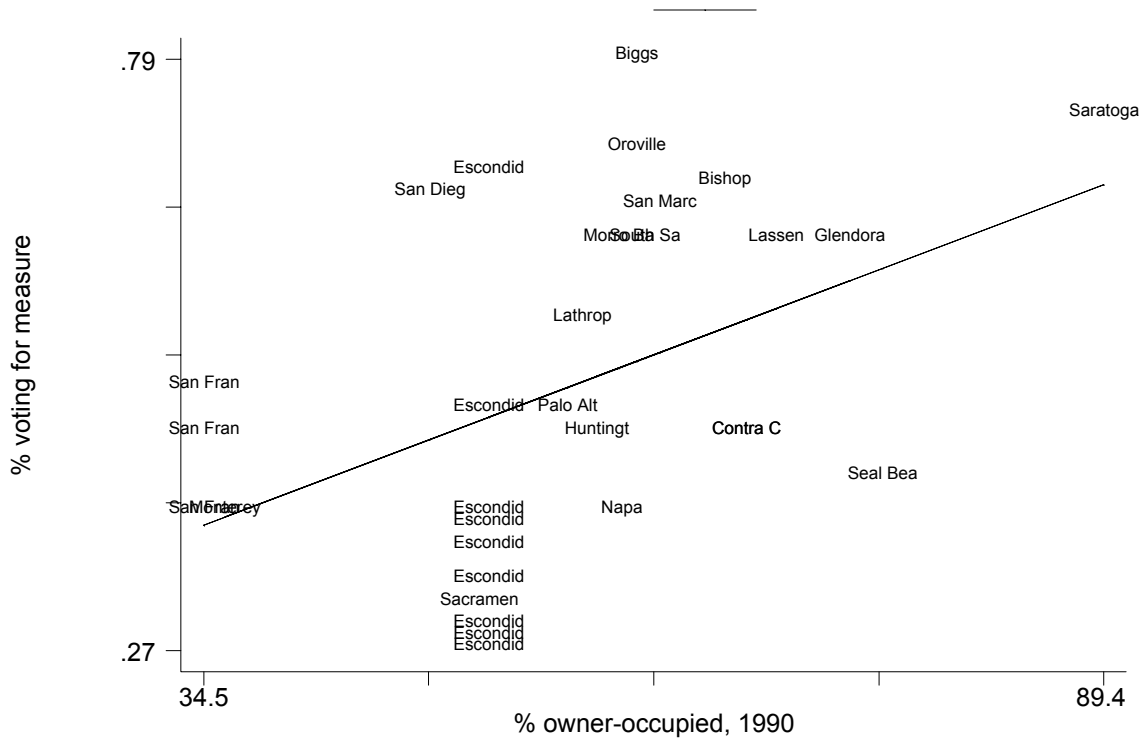
Notes: Series is percent of all federal tax returns itemizing deductions. Data from www.irs.gov.

Figure 3: Homeownership and structure



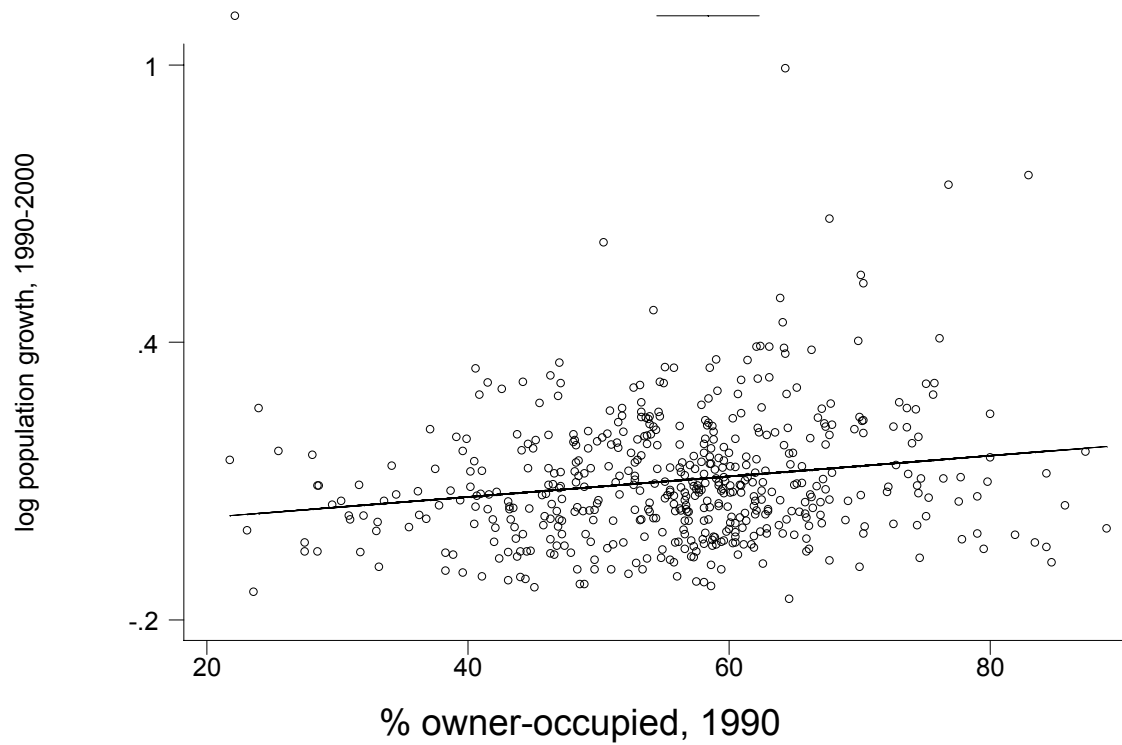
Notes: Graph shows percent of housing owner-occupied and percent of housing that is single-family detached in 1990 for places containing 25,000 people or more. Data from the City and County Data Book, 1994.

Figure 4: Homeownership and support for zoning



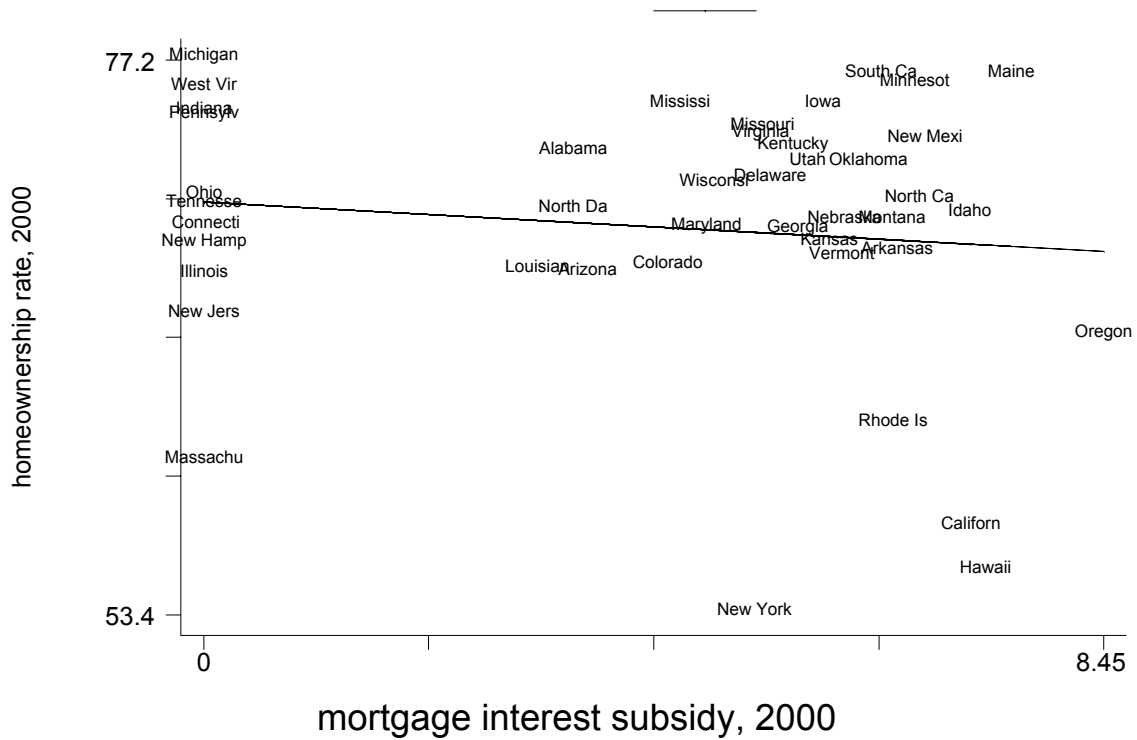
Notes: Percent owner-occupied is based on USA Counties, 1998 and City and County Data Book, 1994, as appropriate for the jurisdiction. Percent voting for measure refers to the percent of voters supporting the year 2000 zoning measure proposed in the California jurisdiction. Data on voting on local measures taken from the California Local Elections Data Archive, 2000, at <http://www.csus.edu/isr/isr3.html>.

Figure 5: Homeownership and city growth



Notes: Percent owner-occupied in 1990 and 1990 population are taken from the City and County Data Book, 1994. Sample includes all cities with 50,000 people or more in 1990. Population in 2000 is from Census 2000 data at www.census.gov. See Glaeser and Shapiro (2001) for more details about growth data.

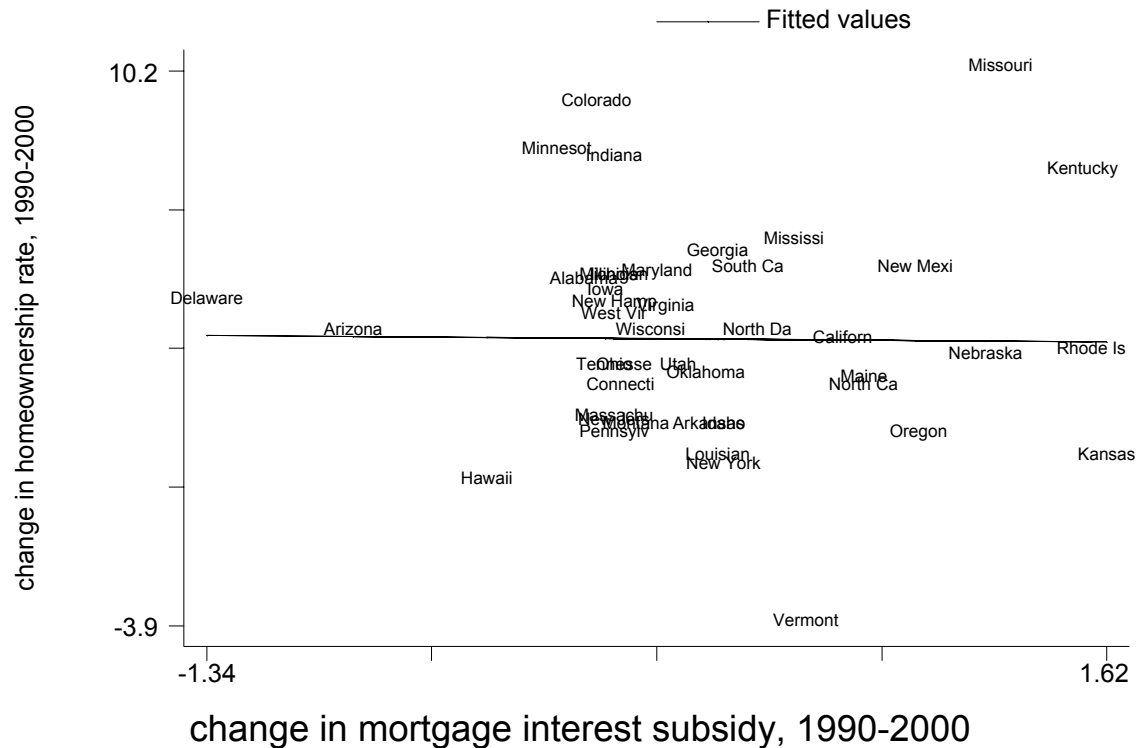
Figure 6: Homeownership and the mortgage subsidy



Notes: Homeownership rate is percent of housing owner-occupied in 2000. Data from www.census.gov. Mortgage interest subsidy is marginal subsidy to mortgage interest of average taxpayer by state from 1990 to 2000. (Income distribution held fixed.) Data from www.nber.org/taxism. See Feenberg and Coutts (1993) for details on the Taxism model.

In particular, the mortgage interest subsidy is calculated as follows: Nationally representative data on income in 1995 is deflated as appropriate for each year and used to calculate the state income tax liabilities owed by each person in the state-year cell. Then mortgage interest is increased by 1% for each taxpayer, the state tax is recalculated, and a marginal tax is calculated as the ratio of additional tax to additional mortgage interest. More details are available at <http://www.nber.org/~taxism/state-avr-rates/index.html>.

Figure 7: Homeownership and the mortgage subsidy



Notes: Change in homeownership rate is change in percent of housing owner-occupied from 1990 to 2000. Data from www.census.gov. Change in mortgage interest subsidy is change in marginal subsidy to mortgage interest of average taxpayer by state from 1990 to 2000. (Income distribution held fixed.) Data from www.nber.org/taxism. See Feenberg and Coutts (1993) for details on the Taxism model.

In particular, the mortgage interest subsidy is calculated as follows: Nationally representative data on income in 1995 is deflated as appropriate for each year and used to calculate the state income tax liabilities owed by each person in the state-year cell. Then mortgage interest is increased by 1% for each taxpayer, the state tax is recalculated, and a marginal tax is calculated as the ratio of additional tax to additional mortgage interest. More details are available at <http://www.nber.org/~taxism/state-avr-rates/index.html>.

Table 1: Itemizing, income, and homeownership

Decile	Percent of itemizers	Percent of itemized income	Percent itemizing			Percent owning residence
			Renters	Homeowners	Total	
1	0.28	0.18	0.36	11.59	3.39	28.76
2	0.69	0.43	0.41	7.85	3.61	42.83
3	1.68	1.03	3.22	14.15	7.71	49.67
4	2.71	1.71	5.05	17.86	12.47	55.47
5	4.21	2.77	7.92	24.48	18.79	64.03
6	6.70	4.07	6.09	34.79	24.14	67.70
7	11.28	7.16	11.30	43.01	33.65	71.55
8	16.71	11.73	14.70	52.77	46.24	83.55
9	24.20	19.64	19.23	70.66	63.89	87.58
10	31.54	51.28	48.22	78.12	75.16	92.61
TOTAL	100	100	5.77	42.65	28.51	64.44

Notes: Data are from authors' calculations based on the Survey of Consumer Finances, 1998. Decile is by household income. Survey weights used in constructing means and deciles.

Table 2: Homeownership and income

	(1)	(2)	(3)
log(income)	0.1917 (0.0027)	0.1317 (0.0029)	0.1316 (0.0036)
itemizer		0.2711 (0.0068)	0.1900 (0.0083)
single-family detached home			0.1229 (0.0217)
home in multi-unit structure			-0.4019 (0.0239)
mobile home			0.0948 (0.0252)
Observations	20215	20215	18525

Notes: Regressions are from authors' calculations based on the Survey of Consumer Finances, 1998. Coefficients are marginal effects from probit models. All coefficients are significant at the 1% level.

Table 3: Subsidy per dollar for itemizers

Real interest \bar{i}	Inflation π	Property tax τ_P	Federal tax τ	Subsidy to homeownership, when itemizing:		
				Always	When own	Never
2%	4%	1%	25%	2%	1%	0.30%
1	4	1	25	2	0	0.25
3	4	1	25	2	1	0.35
2	4	1	25	2	1	0.30
2	3	1	25	2	0	0.25
2	5	1	25	2	1	0.35

Table 4: House value and neighborhood characteristics
 Dependent variable: log house price

	(1)	(2)	(3)	(4)	(5)
mean years of schooling	0.0315 (0.0047)	0.0379 (0.0043)	0.0351 (0.0044)	-0.0017 (0.0020)	-0.0014 (0.0020)
mean lot size	-0.0083 (0.0032)				
mean unit size	-0.0820 (0.0205)				
mean number of problems	-0.2948 (0.0781)				
log mean predicted price		0.0860 (0.0350)			
spline of log mean predicted price:					
bottom third			-0.0102 (0.0444)		
middle third			0.2677 (0.1181)		
top third			0.4004 (0.1199)		
log mean price				0.8906 (0.0202)	
spline of log mean price:					
bottom third					0.9826 (0.0317)
middle third					0.8052 (0.0402)
top third					0.8762 (0.0358)
Observations	3625	4208	4208	4216	4216

Notes: Source is authors' calculations based on the American Housing Survey, 1993 neighborhood cluster sample. All regressions include fixed effects for metropolitan statistical areas (MSAs). Standard errors in parentheses clustered by neighborhood. See Appendix Table 1 for baseline coefficients.

Table 4 (continued): House value and neighborhood characteristics
 Dependent variable: log house price

	(1)	(2)	(3)	(4)	(5)	(6)
garage/carport	0.1562 (0.0294)	0.1003 (0.0280)	0.1265 (0.0276)	0.1417 (0.0279)	0.0680 (0.0170)	0.0663 (0.0172)
basement	0.1403 (0.0300)	0.0664 (0.0294)	0.1286 (0.0288)	0.1295 (0.0287)	0.0297 (0.0119)	0.0264 (0.0119)
central air-conditioning	0.1069 (0.0250)	0.0512 (0.0253)	0.0758 (0.0234)	0.0875 (0.0235)	0.0431 (0.0141)	0.0428 (0.0142)
located in central city	-0.0868 (0.0361)	-0.0468 (0.0361)	-0.0694 (0.0343)	-0.0713 (0.0338)	-0.0210 (0.0113)	-0.0208 (0.0112)
age of structure (years)	-0.0041 (0.0007)	-0.0029 (0.0008)	-0.0035 (0.0007)	-0.0034 (0.0007)	-0.0010 (0.0004)	-0.0010 (0.0004)
number of bathrooms	0.2700 (0.0227)	0.1757 (0.0234)	0.2196 (0.0234)	0.2376 (0.0259)	0.0848 (0.0114)	0.0879 (0.0116)
number of bedrooms	0.0380 (0.0129)	0.0280 (0.0124)	0.0309 (0.0122)	0.0350 (0.0122)	0.0362 (0.0084)	0.0365 (0.0084)
number of other rooms	0.0761 (0.0093)	0.0467 (0.0097)	0.0624 (0.0091)	0.0690 (0.0095)	0.0296 (0.0057)	0.0300 (0.0058)
steam heating	0.2395 (0.0488)	0.1982 (0.0472)	0.2351 (0.0481)	0.2526 (0.0489)	0.0567 (0.0203)	0.0623 (0.0202)
electric heating	0.0559 (0.0412)	0.0517 (0.0334)	0.0573 (0.0366)	0.0628 (0.0354)	0.0005 (0.0238)	0.0027 (0.0237)
other heating type	-0.1368 (0.0388)	-0.0285 (0.0375)	-0.0645 (0.0384)	-0.0649 (0.0383)	-0.0750 (0.0231)	-0.0675 (0.0231)
number of problems	-0.0909 (0.0263)	-0.0551 (0.0256)	-0.0697 (0.0253)	-0.0722 (0.0254)	-0.0272 (0.0195)	-0.0257 (0.0192)
Constant	10.6092 (0.0674)	10.5399 (0.0847)	10.2175 (0.1152)	10.3055 (0.1148)	0.7582 (0.2234)	-0.2472 (0.3462)
Observations	4227	3625	4208	4208	4216	4216

Notes: Source is authors' calculations based on the American Housing Survey, 1993 neighborhood cluster sample. All regressions include fixed effects for metropolitan statistical areas (MSAs). Standard errors in parentheses clustered by neighborhood.

Table 5: Homeownership and social capital

Type of membership organization	Percent of renters who are members	Percent of owners who are members	Probit marginal effect
Fraternal*	5.69	11.34	0.0128
Service*	7.59	12.39	0.0207**
Veterans*	4.77	7.82	0.0022
Union*	9.95	13.20	0.0160
Athletic	19.96	20.13	0.0053
Youth*	8.68	10.42	0.0077
School service*	11.00	15.85	0.0214 ⁺
Hobby*	7.23	11.48	0.0239**
School fraternity	5.32	5.56	-0.0015
Nationality	3.46	3.75	0.0090
Farm*	2.09	4.30	0.0049
Literary	8.78	9.09	-0.0027
Professional*	13.64	17.11	0.0097
Church-affiliated*	9.44	12.97	0.0339 ⁺
Continuous variables (in units of standard deviations from mean)			
How often spend social evening with neighbors*	0.05	-0.12	-0.0214
Total number of membership organizations*	-0.15	0.11	0.0943**

*Indicates that difference in membership rates by homeownership is significant at 5% level.

** Indicates that probit coefficient is significant at 5% level.

+ Indicates that probit coefficient is significant at 10% level.

Notes: Based on authors' calculations from General Social Survey. Details on the survey are available at www.icpsr.umich.edu. Probit regressions include controls for income, a dummy for missing income, age, age squared, educational attainment, a dummy for single-family detached house, sex, race, and marital status.

Table 6: Homeownership and membership

Dependent variable: Number of membership organizations (standardized)				
	(1)	(2)	(3)	(4)
	OLS	OLS	IV	IV
own home	0.2607 (0.0268)	0.0943 (0.0331)	0.6888 (0.3137)	0.3165 (0.2253)
white		0.0479 (0.0317)		-0.0213 (0.0405)
male		0.0364 (0.0251)		0.0377 (0.0214)
married		-0.0183 (0.0279)		-0.0585 (0.0372)
college graduate		0.5745 (0.0324)		0.5617 (0.0403)
high school dropout		-0.3657 (0.0321)		-0.2918 (0.0332)
log(income)		0.0980 (0.0164)		0.0814 (0.0281)
income missing		0.8704 (0.1656)		0.6651 (0.2937)
single-family detached house		0.0763 (0.0310)		-0.0548 (0.1098)
age		0.0035 (0.0043)		-0.0019 (0.0056)
age ² /1000		-0.0107 (0.0430)		0.0288 (0.0502)
Constant	-0.1482 (0.0212)	-1.2588 (0.1721)	-0.4229 (0.1920)	-0.9722 (0.3224)
Observations	5951	5870	5751	5640
R-squared	0.0156	0.1427	0.0016	0.1258

Notes: Based on authors' calculations from General Social Survey. Details on the survey are available at www.icpsr.umich.edu. IV indicates that percent single-family detached housing in metropolitan area in 1980 used in a probit model to produce a predicted probability of being a homeowner. Standard errors in IV regressions adjusted for clustering on metropolitan area.

Table 7: Homeownership and politics

Percent who	Renters	Owners	Probit marginal effect
Know name of local school board head*	22.2	36.8	0.0905**
Know name of U.S. representative*	22.1	43.2	0.1044**
Vote in local elections*	52.4	76.5	0.1075**
Worked to solve local problems*	24.6	39.0	0.0732**

*Indicates that difference in rates by homeownership is significant at 5% level.

** Indicates that probit coefficient is significant at 5% level.

+ Indicates that probit coefficient is significant at 10% level.

Notes: Based on authors' calculations from General Social Survey. Details on the survey are available at www.icpsr.umich.edu. Probit regressions include controls for income, a dummy for missing income, age, age squared, educational attainment, a dummy for single-family detached house, sex, race, and marital status.

Table 8: House value and neighborhood homeownership
 Dependent variable: log value of unit

	(1)	(2)	(3)	(4)	(5)	(6)
% homeowners	0.2630 (0.0882)	0.1827 (0.0911)	0.4736 (0.1128)	0.1512 (0.0793)	0.0834 (0.0805)	0.1756 (0.0977)
mean years of schooling	0.0395 (0.0046)	0.0369 (0.0047)	0.0377 (0.0046)	0.0398 (0.0041)	0.0381 (0.0042)	0.0384 (0.0042)
mean number of problems		-0.2794 (0.0839)	-0.2438 (0.0836)		-0.2467 (0.0732)	-0.2422 (0.0726)
share single-family detached			-0.4154 (0.0960)			-0.1530 (0.0863)
garage/carport	0.0860 (0.0176)	0.0852 (0.0175)	0.0879 (0.0175)	0.1154 (0.0269)	0.1089 (0.0270)	0.1113 (0.0270)
basement	0.0356 (0.0215)	0.0320 (0.0215)	0.0196 (0.0217)	0.1205 (0.0285)	0.1143 (0.0285)	0.1075 (0.0282)
central air-conditioning	0.0419 (0.0172)	0.0415 (0.0172)	0.0425 (0.0172)	0.0693 (0.0230)	0.0655 (0.0231)	0.0655 (0.0231)
located in central city	-0.0506 (0.0426)	-0.0416 (0.0425)	-0.0559 (0.0423)	-0.0689 (0.0338)	-0.0658 (0.0336)	-0.0678 (0.0336)
age of structure (years)	-0.0014 (0.0005)	-0.0014 (0.0005)	-0.0016 (0.0005)	-0.0033 (0.0008)	-0.0031 (0.0008)	-0.0033 (0.0008)
number of bathrooms	0.1519 (0.0121)	0.1518 (0.0120)	0.1515 (0.0120)	0.1996 (0.0216)	0.2006 (0.0220)	0.1988 (0.0219)
number of bedrooms	0.0423 (0.0084)	0.0418 (0.0084)	0.0421 (0.0084)	0.0293 (0.0121)	0.0278 (0.0121)	0.0278 (0.0121)
number of other rooms	0.0461 (0.0064)	0.0461 (0.0064)	0.0457 (0.0064)	0.0577 (0.0090)	0.0580 (0.0090)	0.0571 (0.0090)
steam heating	0.1133 (0.0254)	0.1104 (0.0254)	0.0998 (0.0255)	0.2217 (0.0460)	0.2154 (0.0456)	0.2095 (0.0462)
electric heating	0.0023 (0.0262)	0.0020 (0.0262)	0.0025 (0.0261)	0.0588 (0.0371)	0.0605 (0.0369)	0.0595 (0.0369)
other heating type	-0.0650 (0.0250)	-0.0598 (0.0250)	-0.0543 (0.0250)	-0.0611 (0.0388)	-0.0447 (0.0384)	-0.0419 (0.0384)
number of problems	-0.0293 (0.0156)	-0.0575 (0.0178)	-0.0528 (0.0178)	-0.0662 (0.0250)	-0.0590 (0.0244)	-0.0592 (0.0242)
Constant	10.2984 (0.0870)	10.4288 (0.0953)	10.5606 (0.0996)	10.3071 (0.0966)	10.4142 (0.1032)	10.4874 (0.1063)
Specification	RE	RE	RE	FE	FE	FE

Observations	4225	4225	4225	4225	4225	4225
# of neighborhoods	626	626	626	626	626	626
R-squared				0.6317	0.6349	0.6357

Notes: Source is authors' calculations based on the American Housing Survey, 1993 neighborhood cluster sample. Columns (1) through (3) report results from specification with neighborhood random effects. Columns (4) through (6) report results from specification with fixed effects for metropolitan statistical areas (MSAs) and standard errors clustered by neighborhood.

Table 9: Homeownership and the subsidy

Dependent variable: homeownership rate (%)						
	(1)	(2)	(3)	(4)	(5)	(6)
subsidy (%)	0.0009 (0.0017)	0.0011 (0.0017)	0.0007 (0.0009)			
conventional mortgage interest rate (%)		-0.0777 (0.0365)	0.1433 (0.0353)		-0.0261 (0.0336)	0.2029 (0.0370)
real per capita disposable inc. (\$1000)			0.2815 (0.1821)			0.3405 (0.1733)
share itemizing (%)				-0.0554 (0.0130)	-0.0174 (0.0230)	-0.0558 (0.0162)
people per household			5.2133 (1.3418)			7.1825 (1.3934)
% urban			-1.1951 (0.4116)			-1.0455 (0.3923)
% age 25+ with at least some college			0.3075 (0.0654)			0.2671 (0.0631)
Constant	64.6495 (0.1013)	65.5902 (0.3627)	119.7559 (26.3851)	66.4704 (0.4488)	65.5786 (0.7122)	104.8634 (25.4132)
Observations	148	123	111	144	119	111
R-squared	0.0019	0.0366	0.3407	0.1128	0.0144	0.4050

Notes: Quarterly homeownership data, 1965-2001 from www.census.gov. Columns (1), (2), and (3) use quarterly data on the quarterly change in the CPI beginning in 1965 to calculate subsidy as in Section III. CPI data taken from www.freelunch.com. Columns (2), (3), (5) and (6) use quarterly data on the conventional mortgage interest rate beginning in 1971. Interest rate data taken from www.freelunch.com. Columns (4), (5) and (6) use annual data on percent itemizing beginning in 1965 and quarter 1 homeownership rate. Data on itemizing taken from www.irs.gov. Columns (3) and (6) use annual data on real (chain-weighted) per capita disposable income and population per household. Data from www.freelunch.com. Columns (3) and (6) use data on percent of Americans living in urban areas and percent of adults with at least some college, both taken from www.census.gov and interpolated between decennial census years where appropriate.