

The Mortgage Interest Deduction: Trends and Impacts of the Largest Federal Housing Subsidy

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Abstract

The home mortgage interest deduction represents almost two-thirds of federal home ownership support. How has the size and distribution of this subsidy changed over the past forty years and how has it affected home ownership?

This paper uses aggregate tax return data to estimate that the mortgage interest deduction subsidy doubled in the decade after 1976 to almost one percent of GDP and then fell by a fourth in the early 2000s. These fluctuations were largely caused by broad changes in tax policy, rather than explicit changes in housing goals. Fluctuations in the size of the mortgage interest deduction subsidy do not tend to move with home ownership rates, but instead are procyclical, suggesting that they may exacerbate business cycles. This housing subsidy is increasingly regressive and MID subsidy inequality is correlated with new house size dispersion and income inequality.

Keywords: Homeownership, Debt, Tax Policy

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Note: Values are indexed to 2007 dollars using the consumer price index for all urban consumers, unless otherwise stated.

Introduction

Tax expenditures allow governments to allocate resources through tax code preferences.¹ Some of the largest federal individual income tax expenditures are those lowering the price of owner-occupied housing—the largest being the mortgage interest deduction. This \$88 billion tax subsidy makes up two-thirds of explicit federal support for home ownership.² This study uses IRS tax data to estimate the size and distribution of the federal mortgage interest deduction subsidy over the last four decades and discusses its trends and impacts.

Table 1: Selected 2008 Federal Support for Home Owners (\$2008)

Federal Support for Home Owners, 2008	\$billions
Mortgage interest deduction on owner-occupied residences	88
Property tax deduction on real property	24
Capital gains exclusion on sales of principal residences	17
Neighborhood stabilization program (Economic Recovery Act of 2008)	4
HOME investment partnership	2
Community development block grant program*	~2
Exemption for mortgage subsidy bonds	1
First-Time Homebuyers Credit (2 year program)	<1
USDA Rural Housing Programs*	<1
Discharge of Mortgage Indebtedness*	<1
Housing for People with AIDS*	<1

Sources: Joint Committee on Taxation (2008) and Dept. of Housing and Urban Development

* Support for programs based on 2009 data from Delisle (2009)

¹ Tax expenditures are defined in the Budget Act of 1974 as “revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability.” The Government Accountability Office (2005) writes, “To obtain a given amount of revenue, tax expenditures require overall statutory tax rates to be higher. Otherwise, revenues forgone through tax expenditures reduce the revenue base available for funding federal spending programs. From a budgetary perspective, most tax expenditures are comparable to mandatory spending for entitlement programs, in that no further action is required to provide resources for tax expenditures.” (p. 18)

² This does not include the federal government’s estimated cost for commitments to Fannie Mae and Freddie Mac: \$248 billion upon going into conservatorship in 2008 and an additional \$43 billion in estimated home owner subsidies in the subsequent year (Delisle, 2009). The exclusion of net imputed rental income is not considered in Table 1 because including it with interest deductions would double count subsidies by simultaneously considering housing as consumption and an investment. Considering housing as an investment and owners as landlords implies treating the exclusion of imputed rental income as a subsidy and not interest deductions (Dietz, 2008). Poterba and Sinai (2008) compare distributional effects of reforms associated with these two perspectives. For estimates including net imputed rental income, see Follain, Ling and McGill (1993) and Ling and McGill (1992, 2007).

Housing tax subsidies work as spending programs administered through the tax code (Toder, 2000). However, where tax spending programs like the Earned Income Tax Credit are targeted to low-income workers, housing tax subsidies have always disproportionately favored high income home owners. This study finds that the mortgage interest deduction subsidy has become more regressive. I estimate that between 1970 and 2009 the share of mortgage interest deduction subsidies going to tax filers with real adjusted gross incomes over \$100,000 increased from 30 to 70 percent. Meanwhile, the share of the subsidy going to the bottom two-thirds of tax returns decreased from 16 to 1 percent.

Discussions of housing tax subsidy reform often include forecasts of revenue and distributional impacts and sometimes possible effects on the housing market, home ownership rates and personal savings.³ Often left out of reform discussions are that large fluctuations in housing tax subsidies have had modest impacts on housing outcomes. The mortgage interest deduction subsidy doubled in the decade after 1976 to 0.80 percent of GDP and fell by a fourth in the early 2000s. I show that these large fluctuations did not move with home ownership rates. This is because this subsidy is not targeted to people on the margin between owning a home or renting and is instead allocated based on tax itemizing status and marginal tax brackets. This results in regressive subsidies that mostly benefit households who would own a house even without this subsidy (Glaeser and Shapiro, 2003).

Recognizing this weakness, the President's Advisory Commission on Federal Tax Reform (2005) recommended sharing housing tax subsidies more equally by replacing the mortgage interest deduction with a tax credit equal to 15 percent of mortgage interest. A credit would more likely affect housing tenure decisions because it provides a more progressive subsidy, especially by benefiting non-itemizers. Similarly, the National Commission on Fiscal Responsibility and Reform (2010), or Simpson-Bowles commission, recommended replacing the mortgage interest deduction with a 12 percent non-refundable credit; while the Debt Reduction Task Force (2010), or Domenici-Rivlin commission, recommended a 15 percent refundable credit.⁴

³ For example, see Burman, Toder, and Geissler (2008); Toder, Harris and Lim (2009); and Toder et al. (2010).

⁴ These proposals also disallow deductions on interest from second homes and home equity and cap the total mortgage debt on which interest is deductible at \$500,000 or the annual interest at \$25,000.

These reform efforts make even more sense when considering the seemingly unintentional origin of mortgage interest deductions. As the original federal income tax only affected very top incomes, business income was a large component of these households' income, and so business interest deductions were allowed as a normal expense (Jackson, 2005). Piggybacking along with other forms of interest, the mortgage interest on owner-occupied houses entered the tax code, even though the associated income—imputed rent—was not taxed. Despite their modest beginning, housing tax subsidies now cause large distortions in the U.S. economy. Gravelle (2004) estimates that the marginal effective tax rate for owner-occupied housing is only 2 percent, while for non-corporate investment it is 18 percent and for corporate investment 32 percent. The United States Government Accountability Office (2005, p. 39) writes that this causes “too much investment in housing and too little business investment. The consequence of this is that businesses invest less in productivity-enhancing technology. This in turn results in employees receiving lower wages...”

While the Joint Committee on Taxation (JCT), the Treasury, and others⁵ have used tax return samples to forecast or estimate the revenue impact of the mortgage interest deduction, I have found no series using historical aggregate deductions. To estimate the size and distribution of this tax expenditure over the last four decades, I use IRS Statistics of Income aggregate deductions by income group. While JCT forecasts use a micro-simulation model with precise estimates of individual marginal tax rates, it relies on forecasted itemized deductions. In contrast, my estimates use imprecise marginal tax rates but actual, not forecasted, itemized deductions. This method could improve subsidy estimates both because it accounts for all deductions, instead of relying on a sample, and because forecasts may not anticipate some tax code changes or business cycle fluctuations.⁶ Note that this study only considers federal mortgage interest deductions. State level deduction subsidies can also be large—up to 9 cents per dollar of mortgage interest—and can vary significantly from state to state (Hilber and Turner, 2010).

⁵ Altshuler and Dietz (2008); Metcalf (2008); and Toder, Harris, and Lim (2009)

⁶ For example, this paper's estimates make clear the procyclical pattern of mortgage interest deduction subsidies, while JCT forecasts increase with the 2001 recession and decrease during the run-up in housing prices.

This paper shows that the size of federal mortgage interest deduction subsidies largely fluctuates with broad changes in tax policy, instead of explicit changes in housing goals. This is the price paid by using an indirect means to subsidize home owners—income tax deductions—rather than subsidy levels directly being approved by Congress. While the tax code may be favored politically because it obscures the true cost of these subsidies, it leads to an increasing share of subsidies going to high income home owners as income inequality increases. This is because tax deductions benefit high income households more because of progressive marginal tax rates. The interaction of deductions and progressive marginal rates may also contribute to the observed correlation between mortgage interest tax subsidy inequality and new house size and price dispersion.

When controlling for a number of costs and subsidies to home owners, a regression shows no correlation between mortgage interest deduction subsidies and home ownership rates. Specifically, this analysis shows the importance of controlling for property taxes and property tax deduction subsidies. An extensive literature considers whether housing tax subsidies encourage home ownership, with some finding an effect and others not. For example, Rosen and Rosen (1980) estimate that tax subsidies increase the home ownership rate by four percentage points and Hendershott and Shilling (1982) estimate a slightly larger effect. Glaeser and Shapiro (2003) show that home ownership rates do not correlate with large fluctuations in inflation and itemization rates, which proxy the value of the mortgage interest deduction. Gale, Gruber and Stephens-Davidowitz (2007) write that the interest deduction has little effect on home ownership, but appears to raise housing prices and increase loan-to-value ratios. Hilber and Turner (2009) estimate that mortgage interest subsidies have a negligible effect on home ownership rates in areas with inelastic housing supply but can have a positive effect in areas with more elastic supply. Chambers, Garriga and Schlagenhauf (2009b) estimate that the mortgage interest deduction slightly *decreases* home ownership by causing demand from high income households to drive up mortgage rates and crowd out potential low income home owners. Also, in Great Britain home ownership rates have moved independently from housing tax expenditures. Great Britain eliminated their mortgage interest deduction in 1974 and 1975, replaced it with mortgage interest subsidies, and then reduced the value of these subsidies by 90 percent by 1996. The home ownership rate increased 13 percent over this period (Gale, 2001).

This paper first outlines the deduction subsidy estimation method and then presents estimates of the changing distribution of this subsidy. It then shows how the aggregate subsidy fluctuated over the last four decades, the causes of these fluctuations, and how they relate to changes in home ownership rates.

Method for Estimating Mortgage Interest Deduction Subsidies

Itemizing households can lower their tax liability by subtracting home mortgage interest payments from their tax base.⁷ The mortgage interest deduction tax expenditure (referred to here as a “subsidy”) is the estimated increase in tax revenue that would result from eliminating the deduction, assuming no behavioral responses such as portfolio reallocation.⁸ I estimate the subsidy by multiplying income group i ’s mortgage interest deducted (MID_i) by their expected average marginal tax rate ($AMTR_i$). For example, tax returns with adjusted gross incomes (AGIs) between \$50,000 and \$55,000 deducted \$17.8 billion of mortgage interest in 2007. This income group’s average taxable income of \$28,400—the group’s taxable income divided by the number of returns—implies a marginal tax rate of 15 percent and hence a deduction subsidy of \$2.7 billion. This process is repeated for all n income groups in the IRS data and aggregated to get the total MID subsidy, as shown in equation 1.

$$MID_{subsidy} = \sum_{i=1}^n MID_i \cdot AMTR_i \quad (1)$$

Filers may itemize and also have zero tax liability. These filers cannot lower their tax liability by deducting any additional mortgage interest and some of their existing deducted interest does not lower their tax liability. I expect these unused deductions from nontaxable returns to occur more

⁷ Since 1987, the mortgage interest deduction is limited to interest on \$1 million of debt for first and second homes and \$100,000 for home equity debt (Jackson, 2005).

⁸ Revenue estimates may consider behavioral responses to changes in the tax code, while tax expenditure estimates using micro-simulations only consider tax filers switching from itemizing to taking standard deductions and the estimates in this paper consider neither. Maki (1996) and Dunsky and Follain (2000) consider the effect of the 1986 tax reform on portfolio reallocation. Hendershott, Pryce, and White (2003) and Hendershott and Pryce (2006) consider the effect of deduction reforms in the UK. Gervais and Pandey (2008) and Poterba and Sinai (2011) estimate the impacts of various portfolio reallocation rules-of-thumb.

frequently among low income filers, who have lower tax burdens, so I attribute all deductions on nontaxable returns to the lowest income groups and assume they are all unused.⁹

Estimation methods are described in detail in the appendix. Estimates by income group for select years and comparisons with JCT forecasts are shown in the online appendix. For example, this estimation method finds that the federal MID subsidy in 2003 was \$73.2 billion, while JCT forecasts \$78.3 billion and Poterba and Sinai (2011) estimate \$70.6 billion (values in 2007 dollars).

Distribution of Mortgage Interest Deduction Subsidies

This section first shows how the distribution of deductions and deduction subsidies have evolved over the last four decades and then that the distribution of mortgage interest subsidies is correlated with income inequality and housing size and price inequalities. The most striking observation from Figure 1 is that deductions and deduction subsidies have increased greatly in size over the past forty years. As much of this growth followed population and economic growth, for most of this paper subsidy values are expressed as a fraction of GDP. Another observation is that the amount of mortgage interest deducted follows a similar trend as the deduction subsidy. The subsidy is about a fifth the size of deducted interest, equal to the fraction of income going to federal income taxes. The income group shares of interest deducted and deduction benefits also look similar, but with high income filers receiving a larger share of benefits than share of deductions because of progressive tax rates. For example, 2009 filers with adjusted gross incomes over \$100,000 deducted 46 percent of all mortgage interest but received an estimated 69 percent of the subsidy.

⁹ These two assumptions seem supported by a comparison with estimates based on micro data. The JCT estimates that mortgage interest deduction tax expenditures for those with incomes under \$50,000 were only \$2.7 billion in 2007, similar to estimates in this study of \$3.4 billion when assuming all deductions on nontaxable returns are from the lowest income groups and unused. Including deductions on nontaxable returns would increase this estimate to a less credible estimate of \$13.7 billion.

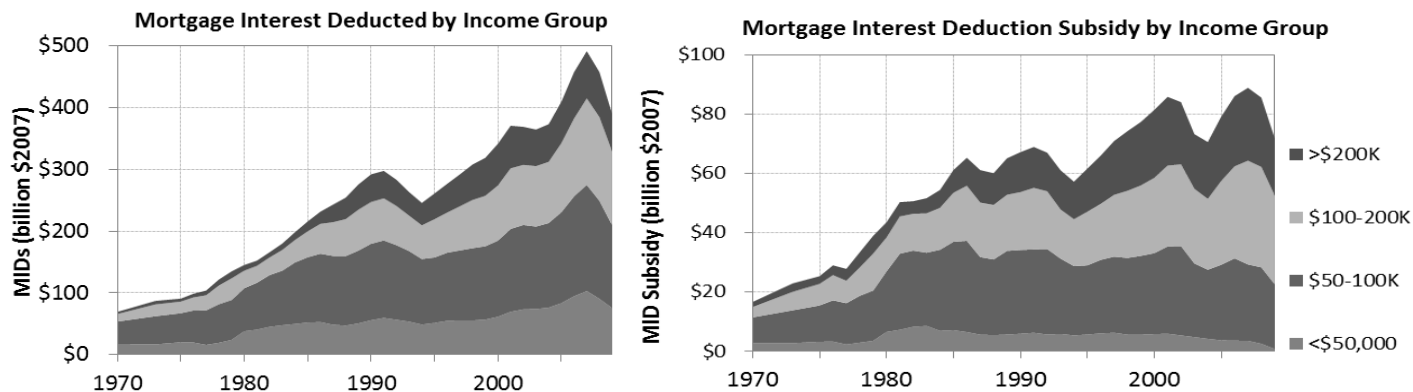


Figure 1: Distribution of mortgage interest deduction subsidies by income group
 Note: Income groups by 2007 AGI.

Mortgage interest deduction subsidies have become more regressive over the last four decades. The fraction of total subsidies going to filers with AGIs over \$100,000 more than doubled since 1970 (Figure A1); and although filers with AGIs over \$200,000 accounted for only 3 percent of tax returns in 2009, they received 27 percent of the subsidy. This deduction subsidy inequality has grown despite some limits on how much mortgage interest can be deducted. For example, taxpayers can only deduct interest on up to \$1.1 million of home mortgage debt, but this affects relatively few households. High income filers’ total deductions have also been limited since 1990, but this limitation should have a small effect on mortgage interest deduction subsidies (discussion in appendix).

The large increase in deduction benefits accruing to high income filers seems largely due to their growth as a share of the population. Between 1970 and 2009, real income growth more than doubled the fraction of filers with mortgage interest deductions and AGIs over \$100,000 (from 6 to 13 percent), while their share of MID subsidies increased at a similar rate (from 31 to 69 percent). Growing deduction subsidy inequality also appears related to growing income inequality. The income share going to the top 10 percent is highly correlated with the MID subsidy share of filers with AGIs over \$100,000, suggesting that housing tax subsidies tend to exacerbate after-tax income inequality (Figure 2).

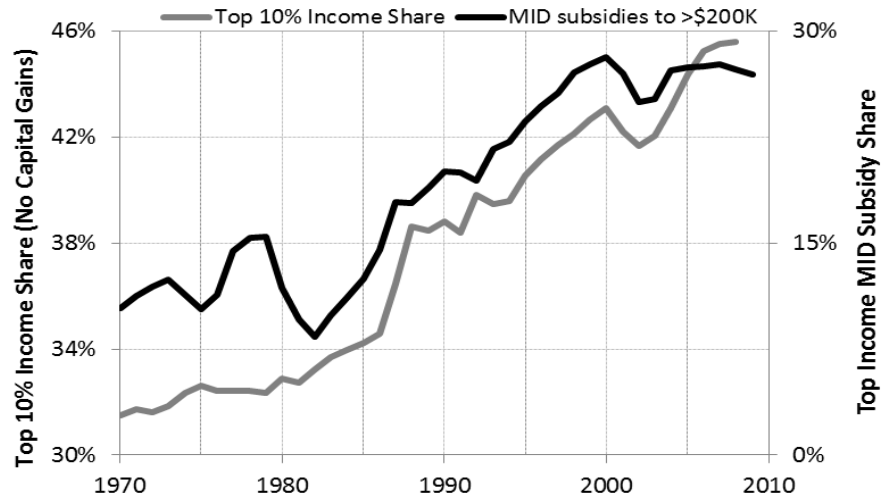


Figure 2: Income concentration is correlated with MID subsidy concentration

Source: Piketty and Saez (2003), updated on Emmanuel Saez's homepage

Note: Top 10 percent income share excludes capital gains and MID subsidy share is for tax returns with \$2007 AGI over \$200,000.
Correlation = 0.960

The average subsidy per tax return rose dramatically between 1970 and 1986 and has since fluctuated slightly, but high income home owners consistently receive a much larger subsidy (Figure 3). This study estimates that the average real subsidy for home owners with real AGIs over \$200,000 grew from under \$2,000 to over \$7,000. The subsidy for home owners with AGIs between \$50,000 and \$200,000 also tripled over the same period, but began from much lower levels. Low income filers receive a negligible average subsidy because they have smaller tax liabilities and often benefit more from claiming the standard deduction than itemizing (Follain, Ling and McGill, 1993).

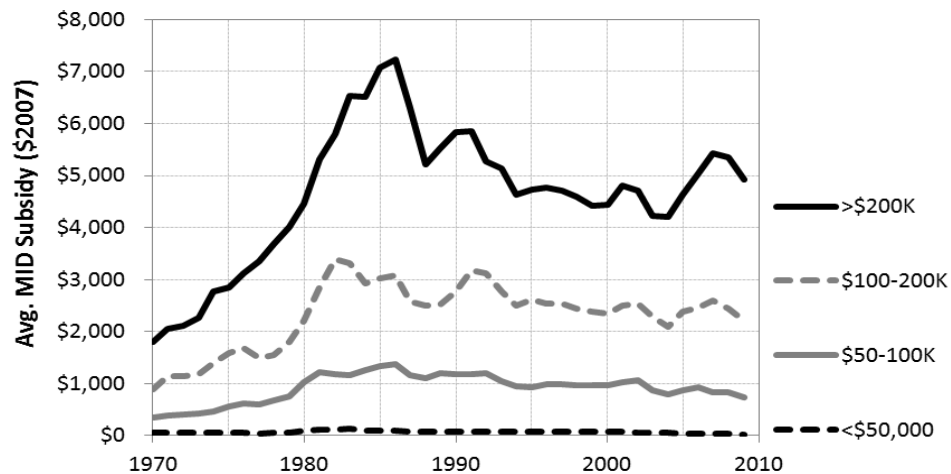


Figure 3: Average real mortgage interest deduction subsidy by income group.

Note: Values show the total subsidy for each income group divided by the number of returns in each income group.
Income groups by \$2007 AGI.

The mortgage interest deduction can influence both the house purchase decision as well as the amount of housing purchased (Hendershott and Slemrod, 1982; Glaeser and Shapiro, 2003). While the mortgage interest deduction subsidy seems to move independently from home ownership rates, its dispersion moves in concert with the dispersion of new house sizes—so as this tax subsidy increasingly goes to high income households then large houses tend to become larger relative to other houses (Figure 4, left side). The subsidy lowers the marginal price of mortgage debt. This causes new house sizes to become more unequal because progressive tax rates mean mortgage interest tax expenditures subsidize high income households more than lower income households. Voith (1999) and Glaeser (2011) extend this reasoning to suggest that housing tax subsidies encourage sprawl as home owners seek larger houses and lots. As expected, mortgage interest deduction subsidy dispersion is similarly correlated with new housing price dispersion (Figure 4, right side). This suggests that regressive housing tax subsidies translate tax progressivity and income inequality into housing value inequality. Alternatively, stronger preferences for housing among top income households are reinforced by regressive housing tax subsidies.

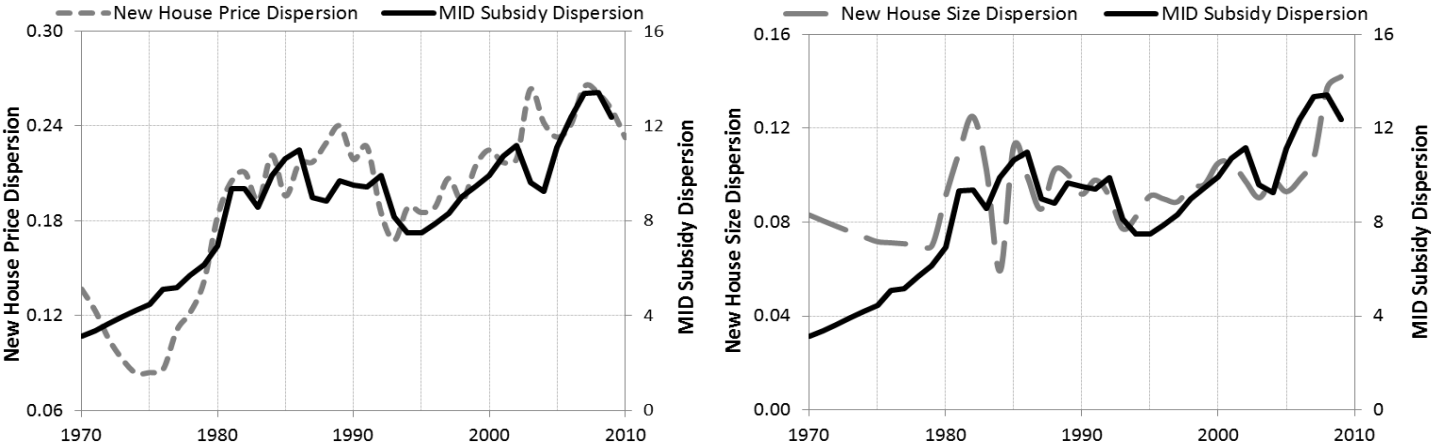


Figure 4: Mortgage interest deduction subsidy dispersion is correlated with new house size and price dispersion.

Source: U.S. Census

Note: New privately owned one-family house completed size and price dispersion is $(\text{average} - \text{median})/\text{median}$.
Correlations = 0.708 (size) and 0.906 (price)

A Narrative Account of Fluctuations in the Mortgage Interest Deduction Subsidy

This paper shows that the total size of the mortgage interest deduction subsidy fluctuated greatly in the past. The subsidy more than doubled from 0.31 to 0.80 percent of the economy between 1970 and 1986 (Figure 5).¹⁰ Increasing interest rates in the 1970s caused bracket creep, that is, increasing nominal income pushed taxpayers into higher tax brackets and these higher average marginal tax rates caused an increase in the MID subsidy. The legislated reduction in tax rates in 1982 and a fall in house prices lowered the MID subsidy in the early 1980s. The MID subsidy reached its highest point in 1986 as the effective mortgage rate peaked and was then followed by a sudden drop. The influence of inflation was especially strong over this period, with high inflation driving up the MID subsidy and lower inflation bringing the subsidy down. Besides the bracket creep mechanism, Duncan and Morgan (1980, p. 383) note that “inflation cuts housing costs substantially for homeowners with mortgages because capital gains income from house price inflation is untaxed but mortgage interest payments are fully deductible.”

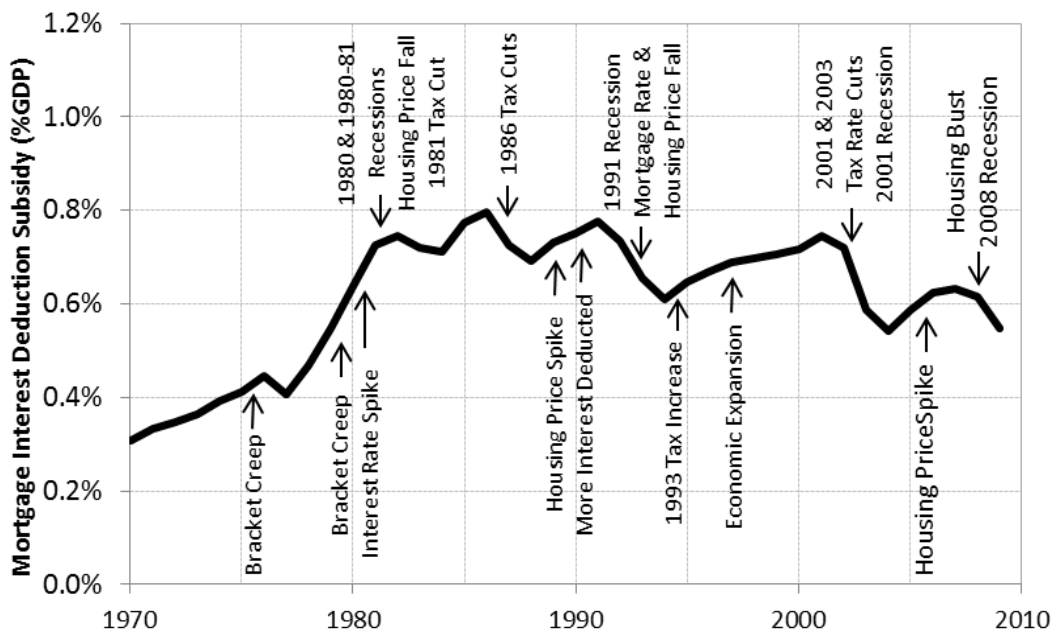


Figure 5: Explanations of mortgage interest deduction subsidy fluctuations

¹⁰ Changes in the MID tax expenditure are reflected in the overall trend of tax expenditures. For example, Burman, Toder and Geissler (2008) estimate that total non-business tax expenditures increased by half—from 4.2 to 6.4 percent of GDP between 1976 and 1985.

After 1986, the MID subsidy fell from 0.80 to 0.54 percent of GDP. Bracket creep was slowed by indexing brackets in 1985 and then top rates were reduced from 50 to 37.5 percent in 1987 and to 28 percent in 1988. These reforms helped drive down the MID subsidy. Falling mortgage rates and home prices in the 1991 recession continued to drive it down. The 1993 tax increase and expansionary period slowly raised the MID subsidy throughout the 1990s, but the combination of tax cuts and interest rate reductions from 2001 to 2003 reduced it substantially.

There was a renewed growth in the mortgage interest deduction subsidy after 2004. Increasing house values and flat mortgage rates pushed up the MID subsidy from 0.54 to 0.63 percent of GDP. The subsequent fall in housing prices, mortgage debt and interest rates related to the 2008 economic downturn decreased the MID subsidy. The JCT projects increases in the MID tax expenditure as tax cuts are scheduled to expire at the end of 2013 and the refundable child tax credit returns to half of its current amount, causing more filers to itemize. Of course, uncertainty about tax policy, house prices and mortgage interest rates adds uncertainty to forecasts of mortgage interest deduction subsidies.

Fluctuations in the mortgage interest deduction subsidy are procyclical—the subsidy increases in expansions and decreases in recessions. For example, the subsidy increased about \$30 billion in the expansion between 1994 and 2001, decreased \$15 billion in the 2001 recession, and then increased about \$20 billion in the following expansion. Figure 6 shows that the mortgage interest deduction subsidy usually falls during periods of high unemployment. Periods of high unemployment are often correlated with falling incomes, tax rates and interest rates—all of which decrease this tax subsidy.

The procyclical effect of the MID is likely to be significant, and operates through several channels. The most direct effect is through fluctuations in housing construction. Indeed, Leamer (2007) emphatically makes this point in an article titled "Housing *is* the Business Cycle." Procyclical tax subsidies also imply procyclical variations in disposable income and thus spending patterns. A possible indirect channel is that larger interest subsidies in an expansion encourage higher levels of leverage (Gale et al., 2007), but then highly leveraged households that lose jobs during a downturn—especially when there are housing price drops—may find it more

difficult to move to find employment.¹¹ For example, Ferreira, Gyourko and Tracy (2010) estimate that households with negative equity are one-third less mobile than those who are not “underwater” on their mortgages.

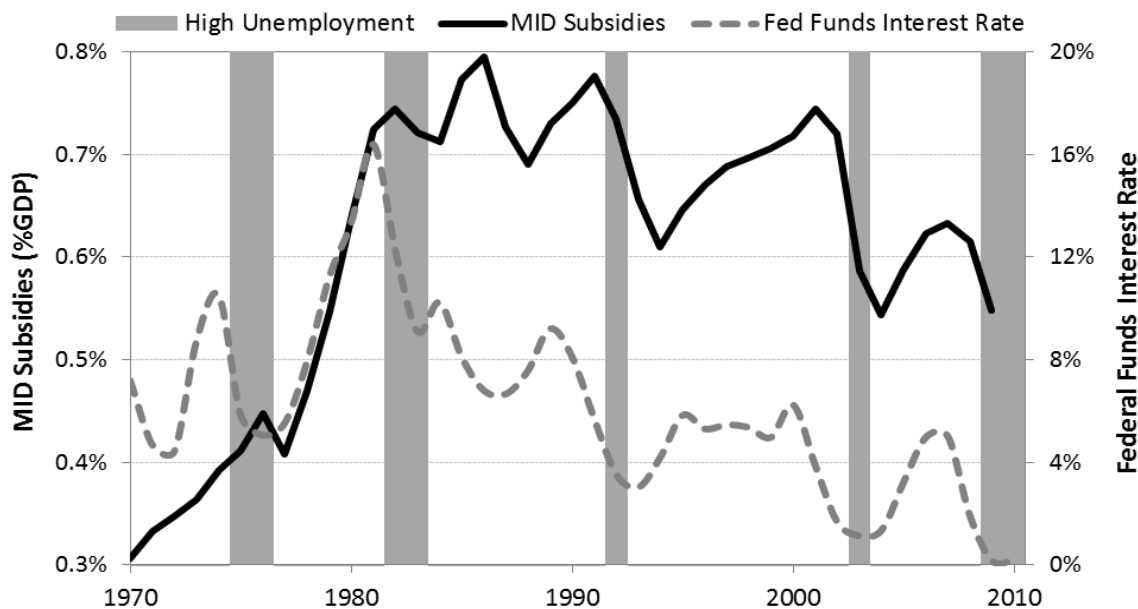


Figure 6: Pro-cyclicality of mortgage interest deduction tax subsidies

Sources: U.S. Bureau of Economic Analysis and Federal Reserve

Note: Gray years are when unemployment is at least one percent above the nine-year central moving average.

What Determines Fluctuations in the Size of the Mortgage Interest Deduction Subsidy?

The previous section provided a narrative of fluctuations in the size of the mortgage interest deduction subsidy. This section more methodically explores the causes of these fluctuations. It first shows that about half of the fluctuations in the MID subsidy are caused by broad changes in tax policy while the other half are due to changes in housing markets. It then explores trends in the components of the subsidy such as housing prices and tax rates.

I divide the causes of subsidy fluctuations into two broad groups: tax policy and housing related fluctuations. Tax policy related subsidy fluctuations are a function of income-weighted average marginal tax rates and the fraction of interest deducted. These explain about half of MID subsidy fluctuations. As suggested in the previous section, these tax policy changes and reactions to them are made in the context of broad tax reforms and without explicit intentions to

¹¹ I thank an anonymous referee for suggesting this mechanism.

affect mortgage interest deduction subsidies or other housing goals. Housing related subsidy fluctuations are a function of changes in mortgage interest rates and mortgage debt, both of which may relate directly to housing policy concerns. Fluctuations in these two components also explain about half of MID subsidy fluctuations, with interest rate fluctuations explaining more of overall subsidy fluctuations (Table 2). Note that subsidy fluctuations caused by mortgage debt may result from changes in ownership rates, house prices or leverage.

Table 2: Mortgage Interest Deduction Subsidy Fluctuation Sources by Decade

	Tax Policy Related Fluctuations		Housing Related Fluctuations	
	Average Marginal Tax Rate	Fraction Mortgage Interest Deducted	Mortgage Debt (%GDP)	Effective Mortgage Interest Rate
1970s	25%	40%	9%	35%
1980s	31%	25%	17%	45%
1990s	11%	41%	10%	47%
2000s	17%	44%	33%	39%
1970-2009	18%	32%	15%	35%

Sources: Barro and Redlick (2009), Federal Reserves Flow of Funds, U.S. Bureau of Economic Analysis, and calculations based on IRS SOI data, see online appendix for details.

Notes: MID subsidy fluctuations by source are the fraction of predicted dependent variable fluctuation, calculated by allowing one independent variable to vary and holding the others at their time period means and using OLS regression coefficients from the entire period (Table A1). Fluctuations are measured by absolute value of arc percent changes in predicted values $[2*(final-initial)/(final+initial)]$ so that increases and decreases have equal weights. MID subsidy and Debt are in %GDP terms.

While interest rate fluctuations clearly drive changes in mortgage rates, they can also have large impacts on changes in mortgage debt. Poterba (1985) estimates that high inflation in the 1970s could account for a third of housing price increases and that persistent inflation could increase the housing stock. Both higher prices and more houses will increase the total amount of mortgage debt. Summers (1981, p. 429) writes that these effects can result from the interaction of inflation and a nonindexed tax code, as accelerating inflation at that time “sharply increased the effective rate of taxation of corporate capital income, while reducing the effective taxation of owner-occupied housing.”

I now consider how the two determinants of the MID subsidy—mortgage interest deductions and tax policy—have fluctuated over the last four decades.

Total Mortgage Interest Paid

The amount of mortgage interest deducted is equal to the mortgage interest paid in a year (MI) times the percent deducted ($\%D_{MI}$); and mortgage interest paid is equal to the total home mortgage debt ($Debt$) times the effective mortgage rate (r), as shown in equation 2. I first consider how the amount of mortgage interest paid relates to debt levels and mortgage rates and then look at the determinants of debt.

$$MID = MI \cdot \%D_{MI} = Debt \cdot r \cdot \%D_{MI} \quad (2)$$

Real home mortgage debt grew steadily from \$1.5 trillion in 1970 to \$10.5 trillion in 2007 before falling slightly. Two periods of rapid debt growth stand out. Mortgage debt increased from about 30 to 45 percent of GDP in the late 1980s and then from 50 to 75 percent in the early 2000s (Figure 7). Mortgage interest payments follow a broadly similar trend as mortgage debt. The mortgage interest paid increased doubled throughout the 1970s and 1980s as interest rates (r) and then housing debt increased. Interest payments then fell with mortgage rates in the early 1990s and increased to four percent of GDP in the 2000s with growing mortgage debt.

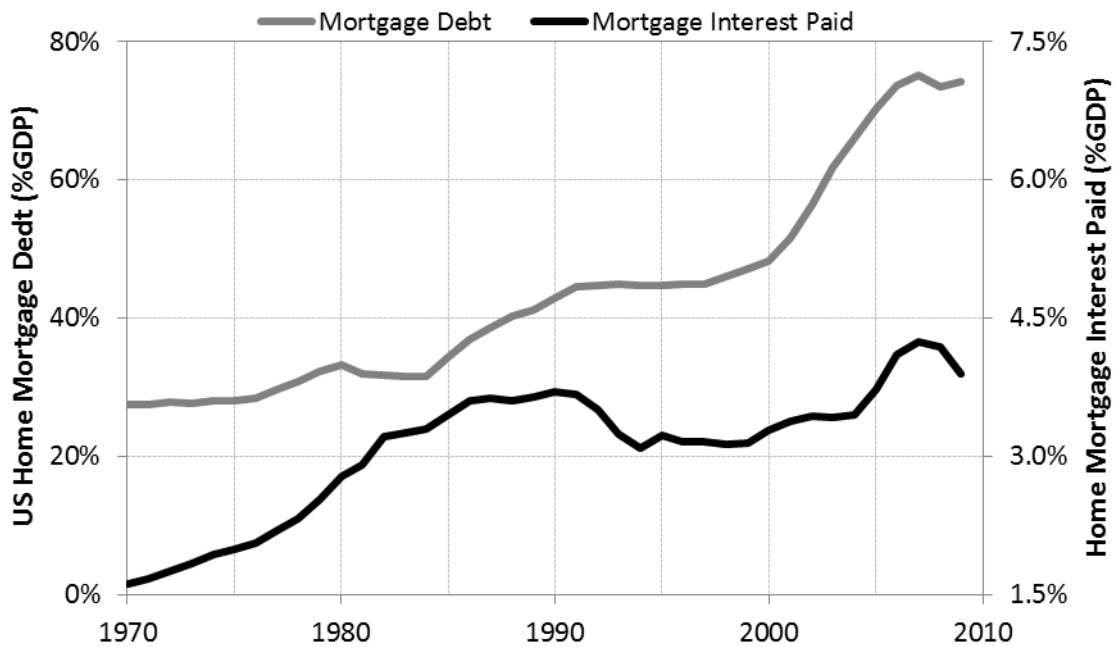


Figure 7: Owner-occupied home mortgage interest paid and home mortgage liabilities as percent of GDP
 Sources: Federal Reserve Flow of Funds and U.S. Bureau of Economic Analysis
 Note: Correlation = 0.760

The aggregate level of mortgage debt is determined by the price of housing, the quantity of housing, and the degree of financing. The increase in mortgage debt between 2000 and 2007 resulted from an increase in all three: more expensive houses, more housing, and more leveraging. The FHFA house price index rose 30 percent and the S&P/Case-Shiller Composite rose 54 percent; the number of housing units grew by 10 percent; and loan-to-value ratios calculated from the Federal Reserve Flow of Funds increased from 40 to 45 percent. Equation 3 says the total debt is equal to average house price (P) times the number of owner-occupied houses (Q) and average loan-to-value ratio for all homes (LTV).

$$Debt = P \cdot Q \cdot LTV \quad (3)$$

The number of owner-occupied houses (Q) has increased steadily since 1970 from 40 to 75 million units with very little variation from its trend, and so does not seem to explain short-run fluctuations in mortgage debt. The leveraging of homes (LTV) also increased gradually until falling prices in 2007 decreased home owners' equity, driving up loan-to-value ratios. Of the three factors, house prices seem to drive fluctuations in mortgage debt (Figure 8). Increasing house prices in the late 1990s and early 2000s are correlated with increasing mortgage interest paid. However, despite three years of steeply declining house prices the amount of debt did not fall much by 2009, as refinancing slowed down and mortgage markets froze during the recent crisis. Price increases may be driven by the increasing size of houses. Since 1970, the average size of new houses steadily increased from 1,500 to 2,500 square feet. However, new house sizes are not correlated with the dramatic price increase since 2000.

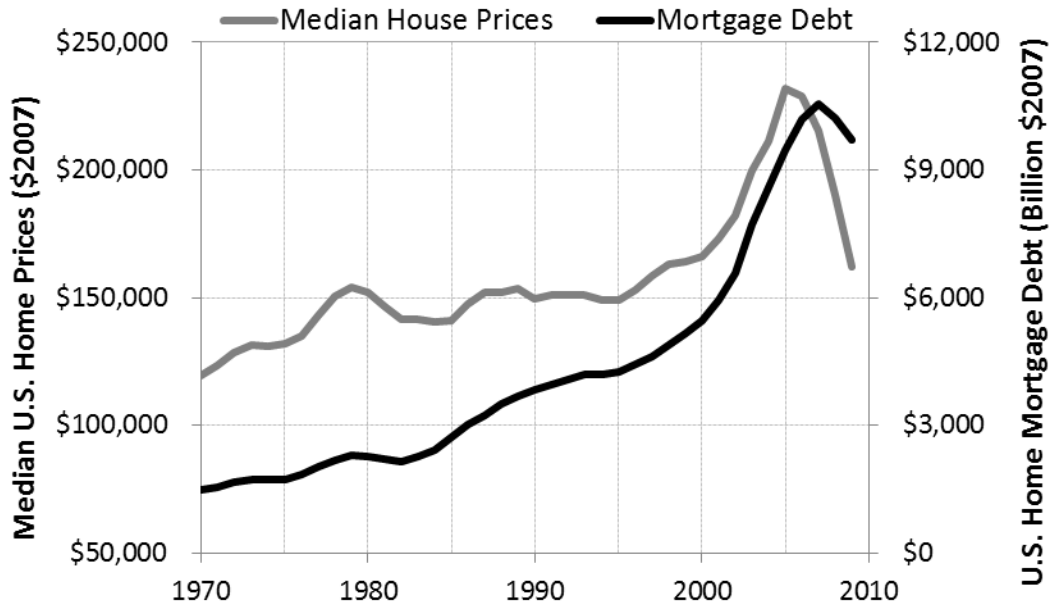


Figure 8: Median sales prices of existing single-family homes and mortgage interest debt
 Source: National Association of Realtors (HX1P series)
 Note: Correlation = 0.908

The Effect of Standard Deductions, Tax Credits, and Tax Rates on the MID Subsidy

Tax changes can drive some of the large fluctuations in the mortgage interest deduction subsidy. Changes in standard deduction levels affect the fraction of mortgage interest deducted and tax rates determine how much deductions reduce revenue. If a taxpayer takes a standard deduction then they receive no mortgage interest deduction subsidy. If a taxpayer itemizes, the deduction subsidy generally equals the amount of interest times their marginal tax rate.

The fraction of interest deducted is determined by both the fraction of filers that itemize and pay mortgage interest and how much of all mortgage interest is paid by these itemizing homeowners. The fraction of returns deducting mortgage interest fluctuated between 20 and 27 percent over the period studied, while the fraction of interest deducted increased to 95 percent and then fell to 80 percent with the 2001 tax cut, as more low income households took on mortgage debt (Figure A2).

The 1986 tax reform is followed by an increase in the fraction of interest deducted—the opposite from what one may expect. The effect of lower tax rates, which decrease the incentive to deduct, seemed to be overpowered by the reform's tax base-broadening, which increased the incentive to deduct mortgage interest. Specifically, the fraction of mortgage interest deducted may have

increased because of the removal of the deductibility of consumer interest with the 1986 reform, which induced shifting from consumer to mortgage debt (Dunsky and Follain, 2000; Maki, 2006; Stango, 1999). Meanwhile, Follain and Ling (1991) note that the 1986 tax reform's expansion of the standard deduction worked to decrease the MID subsidy for lower income households.

The fraction of interest deducted falls as more tax returns have no tax liability. For many years about 5 percent of deducted mortgage interest was from nontaxable returns, but since 2000 the fraction surged to 19 percent (Figure A3). This was likely driven by a reduction in tax liabilities due to the refundable child tax credit. Initiated with the Taxpayer Relief Act of 1997, the credit cost \$25 billion before a 2001 reform doubled the credit per child and the cost to \$50 billion. The effect of the child tax credit may have been strengthened by the preceding growth of the Earned Income Tax Credit—from about \$10 to \$40 billion between 1990 and 2000. The increase in the proportion of interest reported on nontaxable returns could also result from refundable credits inducing non-filers to start filing or eased access to mortgages for low income households resulting from mortgage innovations and government sponsored enterprise policies (Rajan, 2010).

Standard deduction levels also affect the subsidy received by middle and low income home owners. If an increase in the standard deduction level caused a taxpayer to switch from itemizing to taking a standard deduction, then their mortgage interest would no longer lower their tax burden. Changes in the standard deduction can especially affect the amount of subsidy going to middle and low income tax filers as few high income home owners would stop itemizing without the mortgage interest deduction, but many more middle and low income home owners would because of the lower value of their remaining deductions relative to the standard deduction. For more discussion, see the unused deductions section in the appendix.

As shown in Figure 5, the mortgage interest deduction subsidy fluctuates with marginal tax rates. Tax rate cuts and MID subsidy declines coincided in 1982, 1987, and 2002. However, the 1993 tax rate increase coincided with a MID subsidy decline (Figure A4). This tax increase only affected households with incomes over \$195,000 and was overshadowed by the effect of lower interest rates and housing prices. Before 1986, the lack of indexation of tax brackets and high inflation rates meant bracket creep caused an increase in average marginal tax rates, and hence an increase in the MID subsidy.

Observations on Home Ownership Rates

A perennial question is how the mortgage interest deduction affects housing tenure decisions. The estimates of the MID subsidy presented in this paper enable a comparison of fluctuations in the deduction subsidy and home ownership rates. I first compare trends of these two time series and then control for a number of factors affecting the cost of home ownership, but in both analyses find that the MID subsidy and home ownership rates seem to be uncorrelated.

The correlation between deduction subsidies and home ownership rates is very low (0.054).¹² While this comparison does not control for the large number of factors influencing tenure choices, it does show that large fluctuations in the mortgage interest deduction subsidy generally appear unrelated to rates of home ownership. Figure 9 shows how specific subsidy fluctuations moved independent of home ownership rates. When the deduction subsidy doubled to nearly one percent of GDP between 1970 and 1986, the home ownership rate persisted near 64 percent. Despite a subsidy decrease of one quarter between 1986 and 1994, the home ownership rate did not decline. Growth in the home ownership rate in the late 1990s did occur at the same time as an increase in the deduction subsidy—although Chambers, Garriga and Schlagenhauf (2009a) estimate that most of this increased home ownership was not due to increasing tax subsidies, but instead to mortgage innovations. When the 2001 and 2003 tax cuts led to a subsidy decrease of one quarter, the home ownership rate continued increasing. Between 2004 and 2007 the home ownership rate fell despite an increase in subsidies.

¹² The correlation between changes and percent changes of deduction subsidies and home ownership rates is also very low: 0.036 and 0.063.

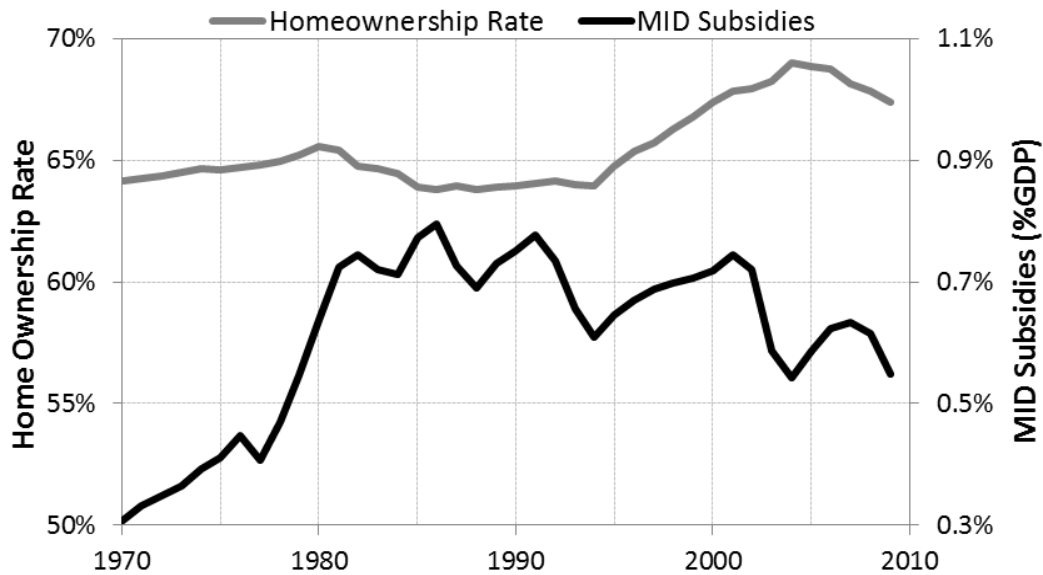


Figure 9: Home ownership rates are uncorrelated with mortgage interest deduction subsidies

Source: U.S. Census

Note: Correlation = 0.054

When controlling for only a few housing costs the MID subsidy seems weakly correlated with home ownership rates, but when controlling for a full set of costs the MID subsidy becomes uncorrelated with home ownership rates. Specification (1) in Table 3 shows a positive and significant correlation between MID subsidies and home ownership rates and a negative correlation with mortgage rates. This suggests that the MID helps home owners offset changing interest costs. As the MID subsidy may encourage leverage and price appreciation (Summers, 1981), I also control for loan-to-value ratios and median house prices. Specification (2) shows that the estimated MID subsidy elasticity of home ownership falls slightly to 0.044. To put this in perspective, this elasticity implies that a subsidy of over \$25,000 per year is required to induce a renter to become a home owner (a one percent change in the subsidy is \$850 million for 0.033 million additional homeowners). This is significantly larger than the median annual rent reported by the U.S. Census of about \$10,000.

Table 3: Mortgage Interest Deduction Subsidies and Home Ownership Rates

	(1)		(2)		(3)	
Mortgage Interest Deduction Subsidy	0.052 ^{***}	(0.006)	0.044 ^{**}	(0.015)	0.007	(0.012)
Effective Mortgage Rate	-0.127 ^{***}	(0.011)	-0.113 ^{***}	(0.022)	-0.081 ^{***}	(0.023)
Loan-to-Value Ratio			-0.048 ^{**}	(0.018)	-0.006	(0.014)
Median Home Price			0.075 ^{***}	(0.017)	0.076 ^{***}	(0.017)
Property Tax Deduction Subsidy					0.065 ^{***}	(0.018)
Property Taxes Paid					-0.091 ^{***}	(0.017)
Constant	-0.476 ^{***}	(0.034)	-0.390 ^{***}	(0.034)	-0.387	(0.212)
R-squared	0.769		0.885		0.943	
Number of Observations	40		40		40	

Sources: U.S. Census, Federal Reserve Flow of Funds, U.S. Bureau of Economic Analysis, National Association of Realtors, Barro and Redlick (2009), author's calculations based on IRS SOI data, see online appendix for details.

Note: Dependent variable is annual home ownership rate. Regression on natural log of all variables 1970 to 2009. Robust standard errors in parentheses and significant at the 5 (*), 1 (**), and 0.1 percent (***) levels. Mortgage interest and property tax deduction subsidies and property taxes paid are in percent GDP terms and Median New Home Prices in millions 2007 dollars.

As property taxes are an important cost of home ownership, specification (3) controls for both property taxes and property tax deduction subsidies, where subsidies are calculated following the same method outlined in this paper for mortgage interest deductions. As expected, the property tax deduction subsidy partially offsets the negative impact of property taxes on home ownership rates. More importantly, controlling for property taxes results in an MID subsidy elasticity that is near zero and insignificant. As tax policy changes often make property tax and mortgage interest deduction subsidies move in concert, this may have caused a spurious correlation between MID subsidies and home ownership rates in the other specifications. Note that even the spurious correlation seemed rather weak, as it suggested that inducing a household to own a home with the mortgage interest deduction costs more annually than paying rent for two households.

Conclusion

The indirect nature of tax expenditures obscures their cost and whom they benefit. Using new estimates, this study shows that the size of the mortgage interest deduction subsidy has fluctuated greatly over the last four decades and that high income households receive an increasing share of these subsidies. Instead of being driven by explicit housing goals, half of subsidy fluctuations

come from broad changes in tax policy. The mortgage interest deduction subsidy overshadows all other federal incentives for home ownership, but large swings in this subsidy do not generally move with home ownership rates. Instead, this increasingly regressive subsidy seems to contribute to housing size and price dispersion. The mortgage interest deduction subsidy is also procyclical and correlated with income inequality—so it may exacerbate both business cycles and after-tax income inequality.

The mortgage interest deduction subsidy doubled in the decade following 1975 from \$30 to \$60 billion, mostly as result of bracket creep. It then increased in the decade following 1992 from \$60 to \$80 billion as a result of sustained economic expansion. It makes little sense to argue that non-housing related tax policy or economic growth justifies increases in real housing subsidies, yet these were major drivers increasing mortgage interest tax subsidies. Rather than relying on idiosyncrasies of the tax code, would it not make more sense to design subsidies targeted to advance explicit housing policy goals?

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Appendix

Calculating Mortgage Interest Deduction Subsidies

Using IRS Statistics of Income data (SOI publications 79 and 1304), I use mortgage interest deductions for various AGI groups to calculate subsidies for four income groups as follows:

First, I assume that deductions on nontaxable returns receive no subsidy, i.e., are all unused deductions, and distribute them to the lowest SOI income groups (SOI lists 24 AGI income groups for 1970-1976, 18 groups 1977-1979, 12 groups 1980-1981, 14 groups 1982-1983, 18 groups 1984-1992, 20 groups 1993-1999, and 24 groups 2000-2009). These nontaxable unused deductions predominantly affect the less than \$50,000 AGI income group—in 1979 less than one percent of deductions were on nontaxable returns for all higher income groups. Although this method underestimates the lowest income group's MID subsidy by assuming too high a fraction of unused deductions, it offsets the overestimation caused by not considering switching to the standard deduction (discussion below).

Second, I multiply the remaining deducted interest by a marginal tax rate based on the average taxable income in each AGI group, where a weighted average of marginal tax rates are used if multiple tax brackets fall in one AGI group. While JCT forecasts tax expenditures by estimating specific tax rates with individual tax returns, I use a single tax rate for all filers in each SOI income group.¹³ The definition of taxable income has changed over this sample, with the exclusion of excludable capital gains before 1987 and the inclusion of capital gains since 1997 and qualified dividends since 2003, but adjusting for these income sources does not push income groups into different tax brackets and so should not influence the analysis.

Third, I allocate mortgage interest deductions and subsidies to the four income groups assuming a linear distribution within the original AGI groups. For very high incomes a

¹³ To assure that taxable income does not vary too much within AGI groups, creating error in estimating subsidy values, I look at microdata for over 27,000 tax returns in 1980 from the Continuous Work History Sample. Among the ten AGI groups, the difference between the 95th and 5th percentiles is at most 108 percent of the mean taxable income for each AGI group. For example, the \$50K-100K AGI group has a 5th percentile of \$36K and 95th percentile of \$76K, corresponding to marginal tax rates of 43 and 54 percent.

Paereto distribution would be more appropriate (Goolsbee, 1999), but as the top cutoff is only \$200,000 this should not strongly bias the allocation among income groups. Missing data (1971, 1972, and 1974) are interpolated with values from neighboring years. All values are indexed to 2007 dollars with the CPI-U.

Why itemized deduction limitations do not change tax expenditures

Itemized deduction limitations have applied since 1990 to filers with AGIs over an indexed threshold (\$156,400 in 2007, and half that for married filing separately). Deduction limitations have been gradually phased out—two-thirds of the limitation applied in 2006 and 2007, one-third in 2008 and 2009, and under current law there is no limitation. The limitation was set by one of two methods. Allowable itemized deductions are reduced 3% of the amount by which AGI exceeds the threshold. If 80% of allowable deductions are less than the 3% excess, then deductions are instead reduced by this fraction, which applies to very few high income filers.

The following example shows that under the 3% rule itemized deduction limitations do not affect MID estimates. A filer has \$250K AGI, \$50K mortgage interest deductions and \$50K other non-interest deductions. If the limitation threshold were \$150K then they have \$100K in excess of the threshold and so a \$3K reduction in allowable itemized deductions. Their taxable income is \$250K minus \$100K of deductions plus \$3K from limitations, or \$153K. If the MID were eliminated then their taxable income would be \$250K minus \$50K in non-interest deductions plus \$3K from the limitation, or \$203K. The change in tax liability with MID elimination is equal to the current mortgage interest deducted ($\$203K - \$153K = \$50K$), thus the limitation does not affect MID estimates.

The Alternative Minimum Tax

The Alternative Minimum Tax (AMT) is not considered in this analysis as interest on total mortgage debt of up to \$1 million is deductible for first and second homes, although interest on home equity is not deductible. Altshuler and Dietz (2008) estimate that that ignoring the AMT relative to the current law tax code only lowers MID tax expenditure estimates by 0.4 percent in 2000 and by 3.0 percent in 2007. As fewer people were affected by the AMT in years before 2000, the effect would have been even smaller. Congress typically passes AMT patches to make

sure that a large number of middle income taxpayers do not fall under the AMT. Altshuler and Dietz (2008) estimate that the MID tax expenditure would have been 18 percent larger in 2007 without the AMT patch.

The Effect of Unused Deductions from Switching

Tax expenditures estimate the increase in tax revenue that would result from eliminating a specific deduction. If the elimination of a deduction caused a taxpayer to switch from itemizing to taking a standard deduction, then only the portion of the interest deducted above this itemization threshold lowers the tax burden, while the portion below is effectively unused. For example, if a married couple has \$59K in taxable income, then their tax liability is \$8K. By deducting \$20K in mortgage interest the couple reduces their liability to \$5K, implying a deduction subsidy of \$3K. If the mortgage interest deduction was eliminated and the couple instead claimed a \$10K standard deduction, then their tax liability would be \$6.5K and so the deduction subsidy would be at most \$1.5K (the original \$8K liability minus the new \$6.5K). So in this example, the MID subsidy estimate is at least twice as large when a filer shifts from itemizing to taking a standard deduction.

Figures and Tables

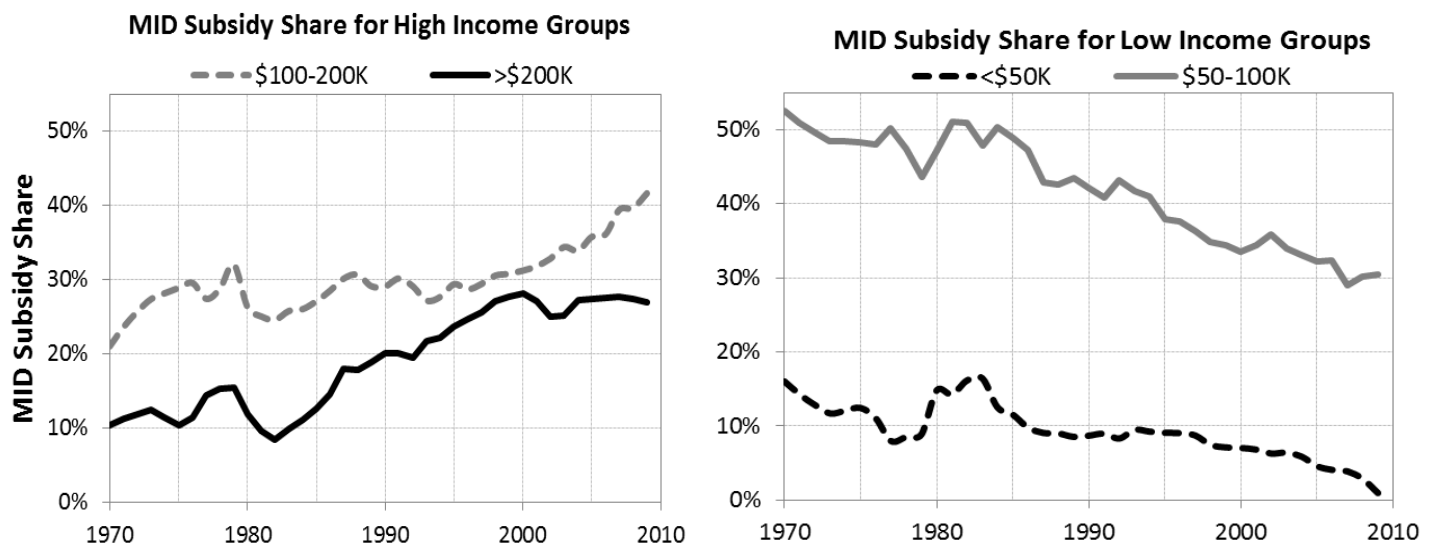


Figure A1: Increasing mortgage interest deduction subsidy shares received by high income groups and decreasing subsidy shares received by low income groups
 Note: Income groups by \$2007 AGI.

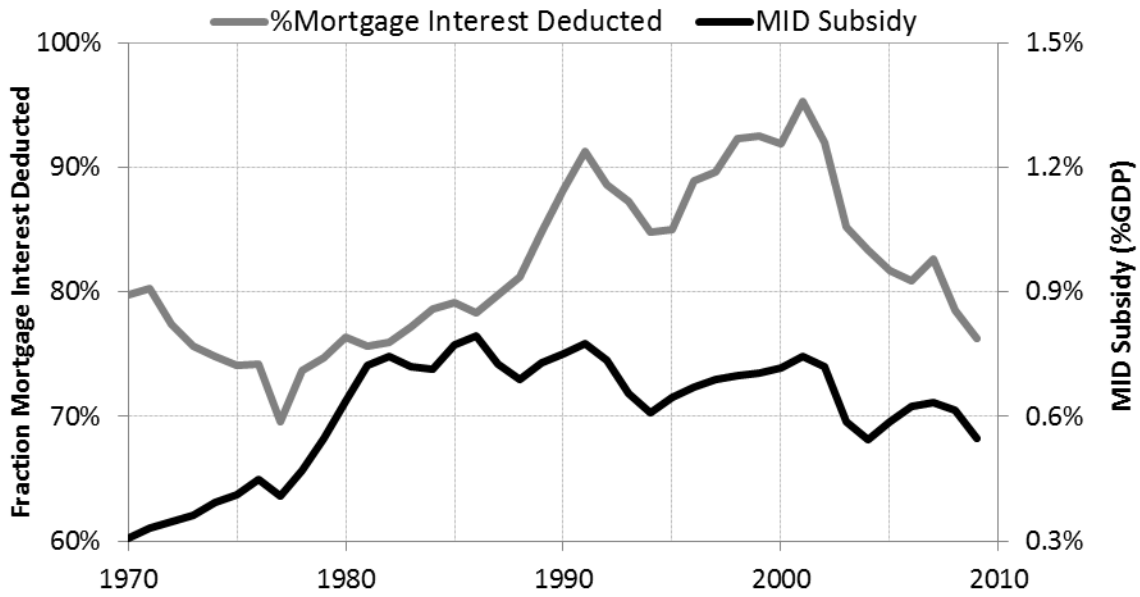


Figure A2: Fraction of mortgage interest deducted and mortgage interest deduction subsidies
 Sources: IRS Statistics of Income and U.S. Bureau of Economic Analysis

Note: Fraction of mortgage interest deducted estimated by dividing total interest deducted on personal tax returns by the aggregate owner-occupied mortgage interest paid in a given year. Correlation = 0.541

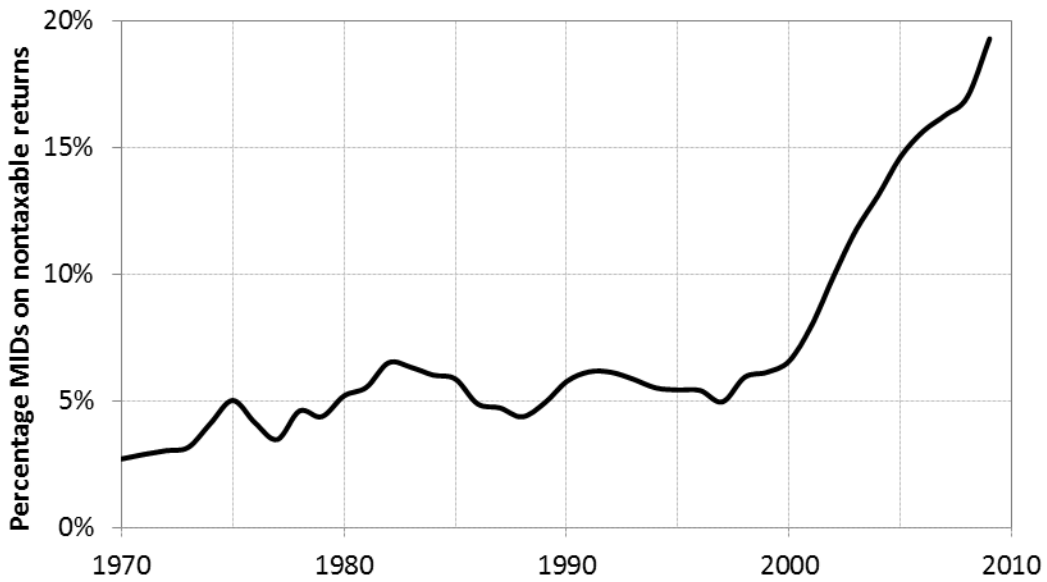


Figure A3: Fraction of mortgage interest deductions on nontaxable returns
 Source: IRS Statistics of Income

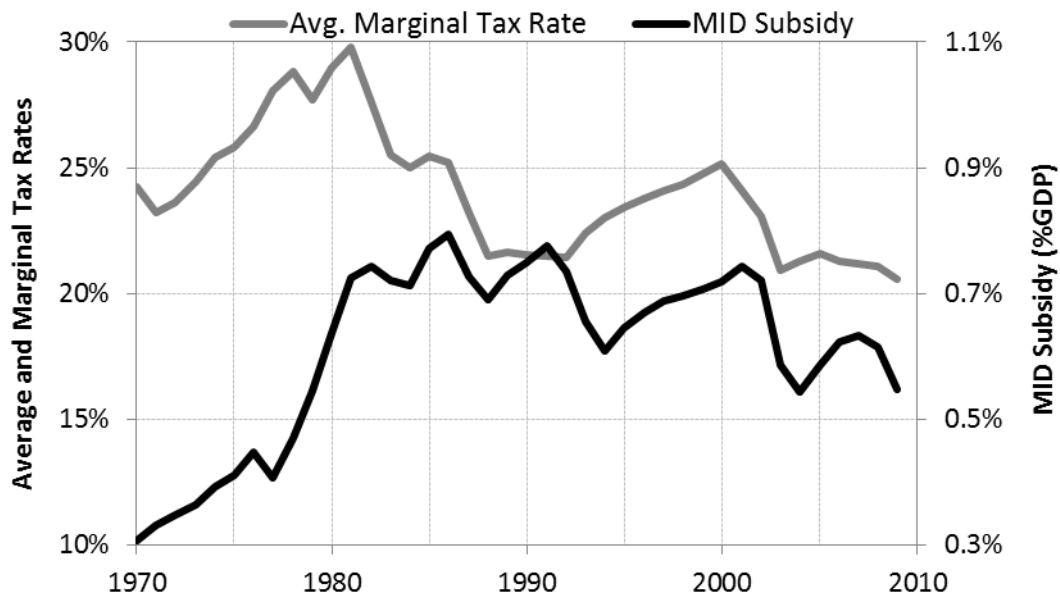


Figure A4: Average income-weighted marginal tax rates and mortgage interest deduction subsidy
Source: Barro and Redlick (2009)

Table A1: Mortgage Interest Deduction Subsidies

Income-weighted AMTR	0.0172 ^{***}	(0.0018)
Fraction of MI deducted	0.0113 ^{***}	(0.0005)
Effective Mortgage Rate	0.0841 ^{***}	(0.0023)
Mortgage Debt (%GDP)	0.0081 ^{***}	(0.0003)
Constant	-0.01780 ^{***}	(0.0006)
R-squared	0.984	
Number of Observations	40	

Sources: Federal Reserve Flow of Funds, U.S. Bureau of Economic Analysis, Barro and Redlick (2009), author's calculations based on IRS SOI data, see online appendix for details.

Note: Dependent variable is mortgage interest deduction subsidy as a percent of GDP. Variables from 1970 to 2009. Robust standard errors in parentheses and significant at the 0.1 percent (***) levels.