

THE MORTGAGE INTEREST DEDUCTION: CAUSES OF FLUCTUATIONS IN A PROCYCLICAL TAX EXPENDITURE

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The mortgage interest deduction is the largest source of U.S. federal homeowner support. I estimate that this tax expenditure fluctuated between 0.2 and 0.9 percent of GDP over the past five decades. About half of these fluctuations were caused by changes in tax policy, rather than changes in the housing market. Fluctuations in the mortgage interest deduction tax expenditure do not tend to move with home ownership rates; instead, they are procyclical, meaning the mortgage interest deduction may exacerbate business cycles.

Keywords: mortgage interest deduction, tax expenditures, housing subsidies, tax policy, marginal tax rates, cyclical policy

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The mortgage interest deduction is considered the largest U.S. federal housing subsidy. This tax expenditure—implicit spending allowing governments to allocate resources through tax code preferences—lowers the price of owner-occupied housing debt. The mortgage interest deduction (MID) tax expenditure was \$59 billion in 2016, as estimated in this paper, and makes up about half of normal federal support to homeowners (Delisle 2009).¹ While the Joint Committee on Taxation, the U.S. Treasury’s Office of Tax Analysis, and others use tax return samples to forecast or estimate the MID tax expenditure, I have found no estimates using historical data (as opposed to forecasts) over more than two decades.² Using tax return microdata, I estimate the size of this tax expenditure over the past five decades. This allows for an analysis of the causes of MID tax expenditure fluctuations and reveals its procyclicality.

Tax expenditures take the form of special exclusions, exemptions, deductions, and credits. These implicit subsidies are akin to spending programs administered through the tax code because a government could instead pay someone an amount equal to their tax reduction (Toder 2000). Moreover, tax expenditures do not require Congressional action and therefore function like automatic entitlement spending. Unlike discretionary spending, which Congress allocates and typically has relatively smooth or countercyclical changes, MID tax expenditures result from the combination of individual housing decisions and the overall structure of the tax system.

¹ Some economists instead focus on the exclusion of owner-occupied imputed rent from taxation, which is sometimes estimated to be a larger tax expenditure than the MID. This exclusion and the MID, however, should not be considered jointly. For example, the Joint Committee on Taxation does not consider this exclusion a tax expenditure. Alternatively, if the imputed rent from owner-occupied housing were taxable, then the mortgage interest deduction would likely not be considered a tax expenditure, as the tax treatment would be comparable to that for tenant-occupied housing—taxable rents and deductible interest (Ozanne 2012).

² Forecasts do not anticipate some tax code changes or business cycle fluctuations. See Altshuler and Dietz (2008), Toder, Harris, and Lim (2009), and Cole, Gee, and Turner (2011) for other estimates based on historical data.

The MID tax expenditure is estimated in this paper to have increased from 0.2 to 0.9 percent of GDP between the early 1960s and 1986. Meanwhile, home ownership rates were unchanged, suggesting little impact of the MID on home ownership decisions. Since 1986, the MID tax expenditure decreased to 0.3 percent of GDP and in 2018 is forecasted to fall to only 0.1 percent of GDP. I find that half of the fluctuations in the components of the MID tax expenditure are due to broad changes in tax policy—such as marginal tax rates and standard deductions—instead of changes in the underlying housing market. MID tax expenditure fluctuations are also estimated to be strongly procyclical. For example, compared to the property tax deduction, MID tax expenditure fluctuations are more than twice as procyclical.

The MID can also have a destabilizing effect on the macroeconomy. I estimate that the MID has acted as an *automatic destabilizer*, a non-discretionary fiscal policy that exacerbates output fluctuations. Similarly, Kingi and Rozema (2017) estimate that the MID decreases the income tax system's stabilization of aggregate consumption by about a tenth. Listokin (2012) discusses how a number of tax expenditures, including the MID, can offset the impact of countercyclical fiscal stimulus. The MID may also exacerbate business cycles through its effect on credit. Increasing incomes during an expansion can increase marginal tax rates, and because of the MID encourage higher levels of leverage (Gale, Gruber, and Stephens-Davidowitz 2007). The resulting credit cycle could increase systemic risk (Mian and Sufi 2011). Also, highly leveraged households who lose jobs during a downturn may find it more difficult to move to find employment, especially when there are housing price decreases. For example, Ferreira, Gyourko, and Tracy (2010) estimate that households with negative equity are one third less mobile than those not “underwater” on their mortgages.

Between 2018 and 2025, the Tax Cuts and Jobs Act (TCJA) increases standard deductions and lowers tax rates. Both of these changes will cause decreases in MID tax

expenditures relative to prior law, with a forecasted to decrease from 0.3 to 0.1 percent of GDP in 2018. Almost two thirds of this forecasted decrease results from increasing standard deductions. About 5 percent of the reduction results from a lower maximum amount of acquisition debt on which interest is deductible (\$750,000 rather than \$1 million) and the elimination of interest deductibility for home equity debt. About one third of the reduction is from other tax changes, mostly lower tax rates.³

This paper proceeds as follows. Section I explains the MID tax expenditure estimation method. Sections II and III discuss the cyclical and causes of tax expenditure fluctuations. Section IV briefly discusses how these fluctuations move independently from home ownership rates. Section V concludes.

I. Method for Estimating MID Tax Expenditures

Itemizing taxpayers, as opposed to those claiming the standard deduction, can lower their tax liability by deducting home mortgage interest payments from their taxable income. The MID tax expenditure is the estimated increase in tax revenue that would result from eliminating this deduction. Equation 1 calculates the federal MID tax expenditure (MID_{TaxExp}) as the difference between taxpayer i 's liability without the MID ($Tax_{i,MID=0}$) and their actual liability with the MID (Tax_i).

$$(1) \quad MID_{TaxExp} = \sum_i (Tax_{i,MID=0} - Tax_i)$$

Note that the tax expenditures estimated in this paper generally do not take behavioral responses into account when estimating tax liabilities without the MID—although they do assume a mechanical switching of tax filers from itemizing to taking standard deductions when

³ Forecasted effects are from a complete tax calculator using a sample of 2015 tax returns extrapolated to match macroeconomic forecasts of the Congressional Budget Office, as described in Joint Committee on Taxation (2015).

this results in a lower tax liability. Some studies consider possible behavioral responses, such as portfolio reallocations (Gervais and Pandey 2008; Cole, Gee, and Turner 2011; Poterba and Sinai 2011).⁴ I briefly discuss alternative results based on a simple adjustment for behavioral effects using estimates from Hanson and Martin (2014). Note that this paper only considers federal mortgage interest deductions. State level deduction tax expenditures can also be large—up to about a tenth of mortgage interest payments—and can vary significantly from state to state (Hilber and Turner 2010).

This analysis uses annual samples of federal individual income tax returns from 1964 to 2016. Each annual cross-section is representative of all tax returns filed in a given year and consists of between 80 and 340 thousand tax returns. I use public use individual income tax files for years before 1979. There is no sample available for 1965; this year is interpolated in figures and excluded from the other analyses.⁵ For years since 1979, I use confidential IRS Statistics of Income (SOI) individual income tax samples.

A simple MID tax expenditure is estimated before applying a number of corrections, such as for the effects of adjacent tax brackets and standard deductions. In the microdata, this is the product of each tax return i 's marginal tax rate (MTR_i), which at this stage is set to the statutory tax rate applying to the last dollar of ordinary taxable income, and mortgage interest deductions (MID_i):

$$(2) \quad MID_{TaxExp} = \sum (MTR_i \cdot MID_i).$$

⁴ Revenue estimates—although not tax expenditure estimates—from the Joint Committee on Taxation also include behavioral effects. See Maki (1996) and Dunskey and Follain (2000) for a discussion of the effect of the Tax Reform Act of 1986 on portfolio reallocations and Hendershott, Pryce, and White (2003) and Hendershott and Pryce (2006) for the effect of deduction reforms in the UK.

⁵ The mortgage interest deduction variable is missing in 1967, 1969, and 1971 and therefore set to either 11 or 11.5 percent of total itemized deductions (and in 1974 to 60 percent of interest deductions) to fit the aggregate trend of mortgage interest deductions. Note that in all years a small fraction of returns are for previous tax years (i.e., late filers).

If a tax return's taxable income is near a bracket threshold then the adjacent rate ($MTR_{i,next}$, usually a higher rate) is applied to any interest deductions exceeding the original marginal tax bracket. I define Gap_i as the difference between a tax return's taxable income and the next highest tax rate bracket threshold. If the MID was repealed then Gap_i is the maximum deduction amount subject to the current marginal tax rate and the MID tax expenditure can be defined as

$$(3) \quad MID_{TaxExp} = \sum_i [MTR_i \cdot Gap_i + MTR_{i,next} \cdot (MID_i - Gap_i)], \text{ if } MID_i > Gap_i.$$

There are several features of the tax code that can make the top statutory tax rates used in Equations 2 and 3 differ from actual marginal tax rates. This can require a number of adjustments. First, I correct for switching to the standard deduction when this results in a lower tax liability than itemizing. This results in limiting the amount of MID affected to the difference between total itemized deductions and the standard deduction that would apply to a tax return if there was no MID.⁶ Second, I account for the child credit and personal exemption phase outs by increasing marginal tax rates of applicable high-income taxpayers. Third, I apply the lower Alternative Minimum Tax (AMT) rate if a tax return is subject to this tax. Fourth, in recent years, I account for itemized deduction limitations, also known as Pease limitations. Finally, to correct for any excessive deductions, since 1987 mortgage interest deductions are limited to \$1.1 million, which combines the deductibility limits of interest on \$1 million of debt for first and second homes and \$100,000 for home equity debt (Jackson 2005). The MID tax expenditure estimates following the

⁶ 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 naive MID tax expenditure of \$3K. If the MID was eliminated, however, the couple would instead claim a \$10K standard deduction (assuming they have few other itemized deductions) and their tax liability would be \$6.5K, implying a correct tax expenditure of only \$1.5K.

method described above match 2015 estimates from a full tax calculator (see Joint Committee on Taxation 2015).

II. A Procyclical Tax Expenditure

Figure 1 shows estimates of the MID tax expenditure between 1964 and 2016. The tax expenditure fell or stagnated during the last six periods of high unemployment immediately following recessions, as indicated by the shaded years.⁷ Periods of high unemployment are often correlated with falling incomes and interest rates, which tend to decrease the MID tax expenditure, as discussed in the next section. Also, over the past three business cycles MID tax expenditures increased and then decreased at least a tenth of a percent of GDP. These observations suggest that fluctuations in the MID tax expenditure are procyclical—increasing in expansions and decreasing in recessions.

Figure 2 compares these historical MID tax expenditure estimates with forecasts from the Joint Committee on Taxation. These forecasts are based on present law and Congressional Budget Office baselines, which usually do not forecast recessions. In comparison to the *procyclical* pattern observed in the historical data, in recent decades the forecasts lag the historical values by a few years and show a *countercyclical* pattern. This follows from forecasts not anticipating some tax code changes or business cycle fluctuation, especially because recessions are usually not forecasted by federal agencies, and suggests the importance of using historical estimates.

⁷ These years of high unemployment are similar to years of below-trend GDP and reflect that incomes and mortgage debt declines slightly lag conventional recession dates, which correspond to quarters of repeatedly declining GDP.

A. Measuring Cyclicity and Destabilization

A more rigorous analysis also suggests that historical MID tax expenditures are procyclical. Following Parker and Vissing-Jorgensen (2010), cyclicity can be estimated in Equation 4 with beta, which is the coefficient on the annual change in the natural log of GDP where the dependent variable is the annual change in the natural log of the MID tax expenditure (both variables are in nominal dollar amounts here). This implies that beta is the elasticity of the MID tax expenditure with respect to GDP. A negative elasticity would suggest a countercyclical relationship, an elasticity of zero an acyclical relationship, and a positive elasticity a procyclical relationship.

$$(4) \quad \Delta \ln MID_{TaxExp} = \alpha + \beta \cdot \Delta \ln GDP + \varepsilon$$

This model results in an MID tax expenditure elasticity of GDP of 2.6 (std. error 0.5). Therefore, MID tax expenditures are procyclical, increasing and decreasing at over twice the rate of the overall economy.

To compare this result to a similar tax expenditure, I estimate the same model with the property tax deduction tax expenditure, often considered to be the second largest federal housing subsidy. The property tax deduction tax expenditure is observed to have an elasticity of GDP of only 1.2 (std. error 0.5), implying that it fluctuates about proportionately with the overall economy.⁸ This comparison suggests that the MID is particularly procyclical.

The analysis above can be extended to estimate if the MID has historically acted as an automatic stabilizer. A destabilizing tax expenditure weakens the overall stabilization of the federal income tax, hence Listokin (2012) refers to them as “stabilization saboteurs.” The effect

⁸ Due to missing data and variables, tax expenditure elasticities for the MID are only estimated since 1966 and for the property tax deduction since 1979.

of the MID tax expenditure on output is attenuated by tax filers with a marginal propensity to consume of less than one. Following Auerbach and Feenberg (2000), Dolls, Fuest, and Peichl (2012), and Kingi and Rozema (2017), I consider a simple approach where tax filers are considered either liquidity constrained and fully adjust their consumption in response to a tax expenditure or not liquidity constrained and make no adjustment.⁹ Because information on wealth is not available from individual tax returns, I assume tax returns with incomes below \$100,000 (2017 dollars) are liquidity constrained, hence their tax expenditures are unchanged, while those with higher incomes have no change in consumption and hence their tax expenditures are set to zero. This results in an elasticity of 2.3 (std. error 0.6), suggesting that the MID acts as an automatic destabilizer.

III. What Determines MID Tax Expenditure Fluctuations?

This section first shows trends in the major components of the MID tax expenditure and then methodically considers the sources of its fluctuations. Equation 5 shows that the MID tax expenditure can be decomposed into the product of mortgage interest deductions (MID) and the average marginal tax rate that applies to those deductions ($AMTR_{MID}$). MID can be further decomposed into the product of total owner-occupied mortgage interest (MI) and the fraction of this interest deducted on individual tax returns ($\%Deducted$).

$$(5) \quad MID_{TaxExp} = AMTR_{MID} \cdot MID \\ = AMTR_{MID} \cdot \%Deducted \cdot MI$$

⁹ In comparison to these studies, I estimate the historical destabilization effect, rather than from simulated recessions that mechanically reduce taxable incomes.

The left side of Figure 3 shows the amount of mortgage interest deducted as a percent of GDP by real income group. Mortgage interest deducted doubled from 1.5 to 3.0 percent between the late 1970s and 1980s, as the effective mortgage rate peaked following a period of high inflation (see Figure A1). The right side of Figure 3 shows that MID tax expenditures also increased in this earlier period. Between 1964 and 1986, the MID tax expenditure more than quadrupled from 0.2 to 0.9 percent of GDP.¹⁰ Among tax filers deducting mortgage interest, average tax expenditures increased four- to five-fold across income groups: for those with incomes below \$50 thousand they increased from \$200 to \$1,000, for incomes between \$50 and \$100 thousand from \$500 to \$2,300, for incomes between \$100 and \$200 thousand from \$1,000 to \$4,000, and for incomes over \$200 thousand from \$2,400 to \$10,900 (all values in 2017 dollars).¹¹

In contrast to the stable level of deductions from the 1980s through 2000s, MID tax expenditures fell immediately after 1986 due to a legislated decline in tax rates. Between 1986 and 1994, the MID tax expenditure decreased from 0.9 to 0.5 percent of GDP. Between 2004 and 2008, there was temporary growth in the MID tax expenditure from 0.5 to 0.6 percent of GDP resulting from increasing mortgage debt, although attenuated by flat mortgage rates (see Figure A1). With the 2008 recession—and decreases in housing prices, mortgage debt, and interest rates—the MID tax expenditure was cut in half to 0.3 percent of GDP.

Figure 4 shows average marginal tax rates of those deducting mortgage interest, where rates are weighted by the share of deductions. Increasing rates before 1985 are due to *bracket creep*—high inflation rates contributed to increasing nominal income, which pushed taxpayers

¹⁰ Changes in the MID tax expenditure during this period 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.

¹¹ Note that average MID tax expenditures conceal large variations within income groups (Cole, Gee, and Turner 2011). For a discussion of the MID's effect on tax progressivity, see Hemel and Rozema (2017).

into higher tax brackets. Bracket creep was slowed by the indexation of brackets to inflation in 1985. The marginal rates of all income groups then fell with the Tax Reform of 1986, although for a couple years a 33 percent “bubble rate” in the middle of the 28 percent bracket caused top income group marginal rates to fall just below those of a lower income group. A 1993 tax change increased the top statutory tax rate, but then 2001–2003 tax changes lowered all rates. In 2013, these lower rates were made permanent, with the exception of the top rate.¹² As a note of caution, the marginal rates in Figure 4 are only for those deducting mortgage interest. The marginal rates of the bottom income group are not representative of average filers with those incomes. Most low-income filers have much lower marginal tax rates (often zero) and are excluded from this analysis because they are more likely to claim the standard deduction than itemize (Follain, Ling, and McGill 1993).

Fluctuations in average marginal tax rates may affect the amount of mortgage interest deducted. Hanson and Martin (2014) estimate that an increase of one percentage point in the tax rate applying to deductible interest increased deductions in 2007 by about \$450. I convert this absolute dollar estimate to a fraction of mortgage interest deductions and then calculate behavior-consistent deductions using average marginal tax rate deviations from the long-run average since 1964. The resulting behavior-consistent deductions (and tax expenditures) are similar for most years, but much lower than the actual amounts in the early 1980s, when marginal tax rates were higher than the long-run average. For example, behavior-consistent deductions as a percent of GDP only increased by about a third between 1976 and 1986 (from 1.3 to 1.8 percent), while actual deductions nearly doubled (from 1.5 to 2.7 percent).

¹² See Auten, Splinter, and Nelson (2016) for a discussion of these tax reforms.

Figure 5 shows the fraction of mortgage interest deducted since 1964. This fluctuates between 67 and 96 percent of mortgage interest for owner-occupied housing, as reported in national accounts by the Bureau of Economic Analysis. These fluctuations were often caused by changes in standard deduction levels, because if a taxpayer takes a standard deduction then they are considered as receiving no MID tax expenditure. The sharp increase from 1964 to 1971 was caused by the inflation-driven bracket creep discussed earlier, as the standard deduction was also not indexed before 1985. The decrease in the fraction of mortgage interest deducted between 1971 and 1977 was partly caused by increases in standard deductions in 1972 (from \$1,050 to \$1,300) and in 1975–1977 (from \$1,300 to \$2,200), and possibly from income shocks related to the 1969 and 1973 recessions.¹³ This was followed by another decade of bracket creep increasing the fraction deducted. Then the Tax Reform Act of 1986 eliminated the deductibility of consumer interest, which induced shifting from consumer to mortgage debt among those who itemized (Maki 1996; Stango 1999; Dunsky and Follain 2000). This portfolio adjustment effect, which tended to increase the fraction of mortgage interest deducted, appears to have outweighed countervailing effects of increased standard deductions. This was followed by a decade of real income growth pushing homeowners into higher tax brackets and therefore deducting a larger share of mortgage interest.¹⁴ Since the 2008 recession, the fraction deducted has trended downwards. In part, this may have resulted from changes in the composition of debt holders; for example, a larger fraction of mortgage debt held by those with lower incomes, perhaps due to a growing population of retirees or tightening lending requirements.

¹³ Ventry (2010) discusses how these standard deduction increases were part of a strategy to weaken itemized deduction tax expenditures.

¹⁴ On average, only a quarter of tax returns deducted mortgage interest during this period and therefore real increases in taxable income around the 75th percentile should drive this effect.

A. Causes of MID Tax Expenditure Fluctuations

The causes of tax expenditure fluctuations are divided into two broad groups—tax policy and housing-related fluctuations. Tax-policy-related fluctuations are a function of average marginal tax rates ($AMTR_{MID}$) and the fraction of mortgage interest deducted ($\%Deducted$). As suggested previously, these fluctuations often result mechanically from the tax code (e.g., bracket creep) or from broad tax reforms, which usually lack explicit intentions of affecting MID tax expenditures or other housing policy goals. Housing-related fluctuations in supply and demand are captured here by changes in total mortgage interest (MI), expressed as a percent of GDP.^{15,16} Note that this division ignores possible interactions between changes in tax policy and the amount of mortgage interest: post-1986 tax-policy-induced portfolio adjustments, asymmetric changes in the composition of debt holders over the income distribution, or effects of the MID on housing prices and hence mortgage debt (Glaeser and Shapiro 2003; Martin and Hanson 2016). Overall, these effects suggest that some of the estimated housing-related fluctuations may actually be due to underlying tax policy changes.

To illustrate the decomposition approach, Table 1 considers the increase of the MID tax expenditure from 0.19 to 0.88 percent of GDP between 1964 and 1986 and the decrease to 0.31 percent of GDP by 2016. The top panel shows average marginal tax rates, fractions of interest deducted, and total mortgage interest underlying these tax expenditures. The middle panel shows the percentage change in these values. Due to the multiplicative nature of these values relative to the MID tax expenditure (see Equation 5), when holding the other variables constant, the 1964 to 1986 increase in the average marginal tax rate would be responsible for a 71 percent increase in

¹⁵ Mortgage interest is calculated as the MID tax expenditure divided by the marginal tax rate and fraction deducted.

¹⁶ Fluctuations in mortgage interest can be further decomposed into fluctuations from mortgage debt and the effective mortgage interest rate, as shown in Figure A1, but these variables are not independent from one another and therefore not considered separately. Note that effective mortgage rates change more slowly over business cycles than the federal funds rates but, due to refinancing, more quickly than effective rates of only new mortgages.

the MID tax expenditure. The effect from the increase in the fraction of interest deducted is 18 percent and from the increase in mortgage interest is 133 percent. A similar pattern is seen for absolute changes between 1986 and 2016, although the fraction of mortgage interest deducted moves in an opposite direction from the other variables. This analysis, however, only considers the changes between two specific years and is therefore limited by the exclusion of fluctuations in intervening years.

The bottom panel considers average annual fluctuations for all years, where the absolute value of changes are used to account for both increases and decreases. To verify that estimates are not sensitive to the number of years over which changes are considered, I also estimate changes for 2- and 3-year periods. For all changes considered, tax policy and housing-related fluctuations are about equal, suggesting that each explains about half of MID tax expenditure fluctuations.

IV. Home Ownership Rates and MID Reforms

An extensive literature considers the relationship between the MID and home ownership rates, with recent work generally finding a negligible or negative effect. Glaeser and Shapiro (2003) show that home ownership rates do not correlate with large fluctuations in inflation and itemization rates, which they suggest should approximate changes in MID tax expenditures. Gale, Gruber, and Stephens-Davidowitz (2007) argue that the interest deduction has little effect on home ownership, but appears to increase housing prices and loan-to-value ratios. Hanson (2012a) estimates that the MID does not affect home ownership, but instead increases the size of homes purchased. Hilber and Turner (2010) find that in areas with more elastic supply mortgage interest deductions only have a positive effect on home ownership rates for higher income households, but in areas with less elastic supply these deductions decrease ownership rates.

Chambers, Garriga, and Schlagenhaut (2009) 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 low-income potential homeowners. Specifically, the MID increases the mortgage rate by an estimated four percent (Hanson 2012b). International evidence also suggests the MID does not affect home ownership rates (Bourassa et al. 2013).

Figure 6 compares MID tax expenditure estimates and home ownership rates over the last five decades. The correlation between MID tax expenditures and home ownership rates is low (0.33). While this comparison does not control for the large number of factors influencing individual decisions to own or rent, it shows that large fluctuations in the MID tax expenditure tend to move independently from rates of home ownership. Particularly striking is that when the tax expenditure more than quadrupled between 1964 and 1986, the home ownership rate persisted near 64 percent.

A weak link between MID tax expenditures and home ownership seems unsurprising. The origin of the MID appears unrelated to home ownership and it does not target people on the margin between owning a home and renting (Ventry 2010). Instead, the MID tax expenditure is allocated based on tax itemizing status and marginal tax brackets. This results in tax expenditures that mostly benefit households who would own a house even without this subsidy (Glaeser and Shapiro 2003). Hence, reform proposals often propose converting the MID to a tax credit, which would more likely affect tenure decisions (that is, whether to rent or own) because it provides a benefit to non-itemizers (National Commission on Fiscal Responsibility and Reform 2010; Debt Reduction Task Force 2010).

V. Conclusion

Using tax return data, I estimate that the size of the mortgage interest deduction tax expenditure has fluctuated greatly over the last five decades. The MID tax expenditure increased from 0.2 to 0.9 percent of GDP between the early 1960s and 1986 and fell to 0.3 percent by 2016. Due to the TCJA, it is forecasted to decrease to only 0.1 percent in 2018. When controlling for behavioral responses to marginal tax rates, these large swings are somewhat attenuated. In comparison to forecasted tax expenditures, which show a countercyclical pattern in recent decades, historical estimates show a procyclical pattern.

Despite overshadowing all other federal subsidies for home owners, large swings in the MID tax expenditure do not generally move with home ownership rates. In fact, half of fluctuations in the components of the MID tax expenditure are from tax policy. Rather than following from explicit housing policy goals, these tax policy effects follow from large tax reforms or mechanical effects of the tax code, such as bracket creep. Finally, because the MID tax expenditure is procyclical, it serves as an automatic destabilizer, tending to exacerbate business cycles.

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TABLE 1
Mortgage Interest Deduction Tax Expenditure Fluctuation Sources

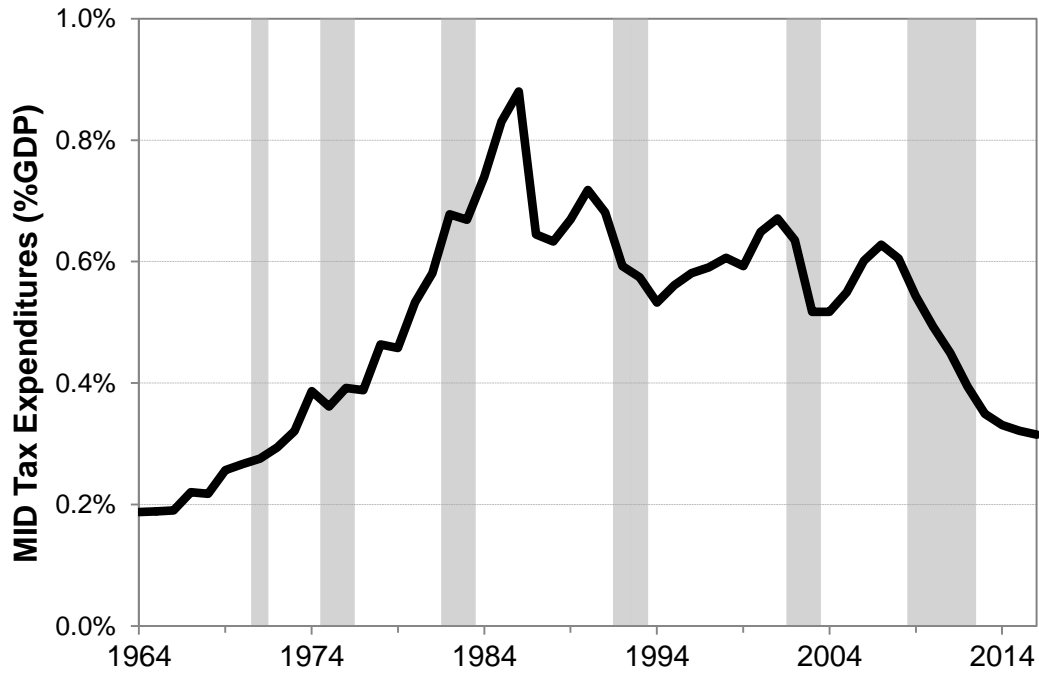
| | MID Tax Exp. (%GDP) | Tax-Policy-Related Fluctuations | | Housing-Related Fluctuations |
|--|---------------------------|---------------------------------|--|------------------------------|
| | | Average Marginal Tax Rate | Fraction Mortgage Interest Deducted | Mortgage Interest (%GDP) |
| 1964 | 0.19 | 0.19 | 0.67 | 1.50 |
| 1986 | 0.88 | 0.32 | 0.78 | 3.50 |
| 2016 | 0.31 | 0.21 | 0.71 | 1.76 |
| Percentage change (%) | | | | |
| 1964–1986 | --- | 71 | 18 | 133 |
| 1986–2016 | --- | –35 | 10 | –50 |
| Average percentage changes, 1964-2016 (%) | | | | |
| 1-year | --- | 4 | 2 | 4 |
| 2-year | --- | 6 | 4 | 8 |
| 3-year | --- | 8 | 4 | 12 |

Notes: Average percentage changes are based on absolute values of percentage changes in each variable and exclude changes using 1965 due to missing data.

Sources: Author's calculations based on IRS SOI and Bureau of Economic Analysis data.

FIGURE 1

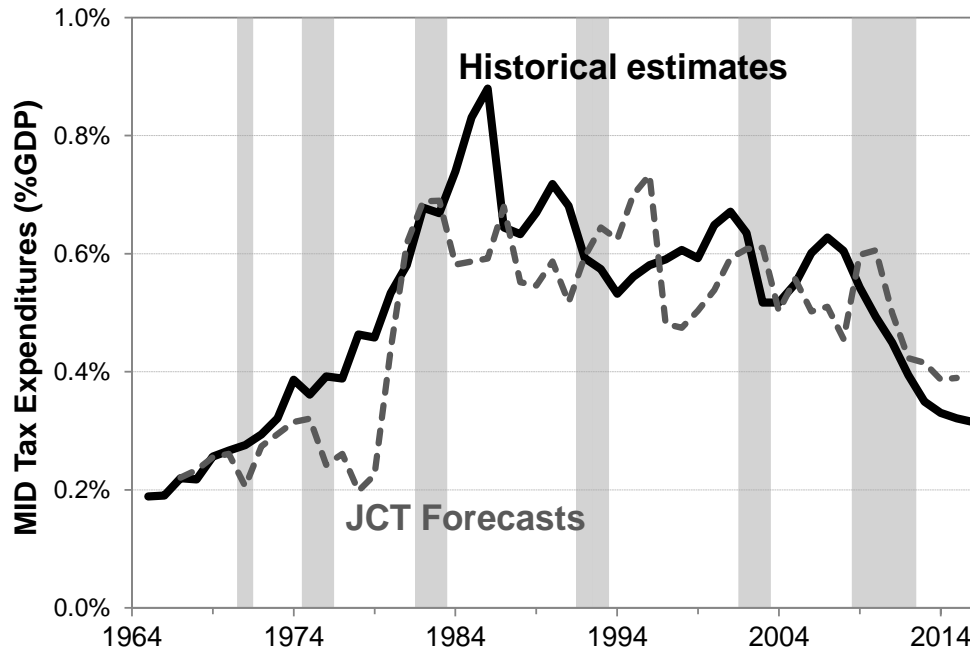
Pro-cyclicality of mortgage interest deduction tax expenditures



Notes: Shaded years indicate an unemployment rate at least three-quarters percentage points above the 9-year moving average.
Sources: Bureau of Labor Statistics and Author's calculations using IRS SOI data.

FIGURE 2

Comparison of historical and forecasted MID tax expenditures

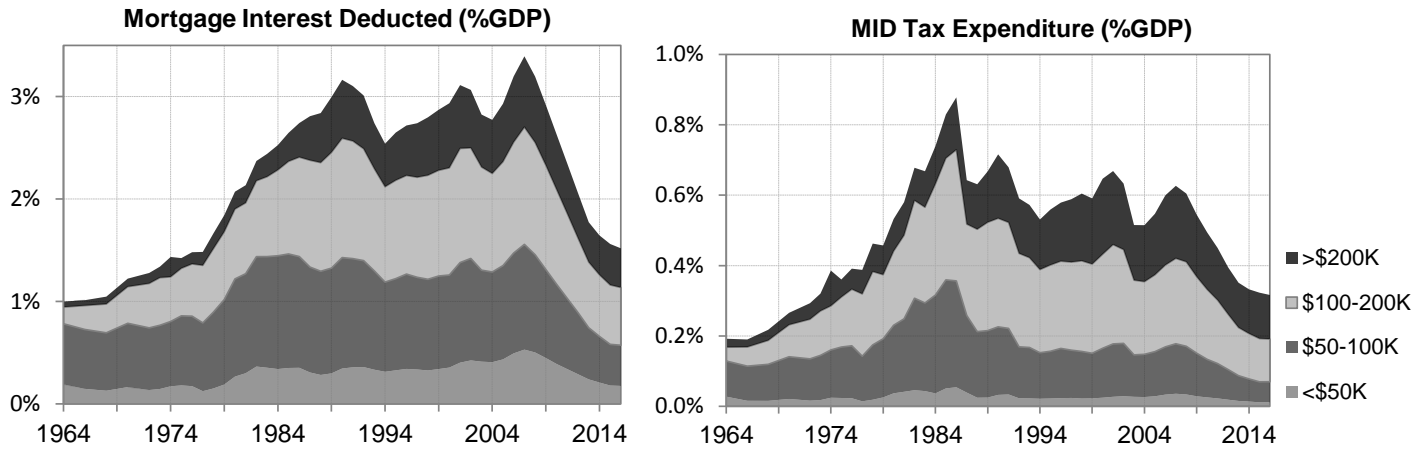


Notes: MID tax expenditures for calendar years and JCT forecasts since 1974 for fiscal years. JCT estimates prior to 1973 are historical estimates, not forecasts, and other estimates are usually from reports issued the same or prior year. Shaded years indicate an unemployment rate at least three-quarters percentage points above the 9-year moving average.

Sources: Author's calculations using IRS SOI, BLS, BEA, and JCT.

FIGURE 3

Mortgage interest deductions and tax expenditures by real income group



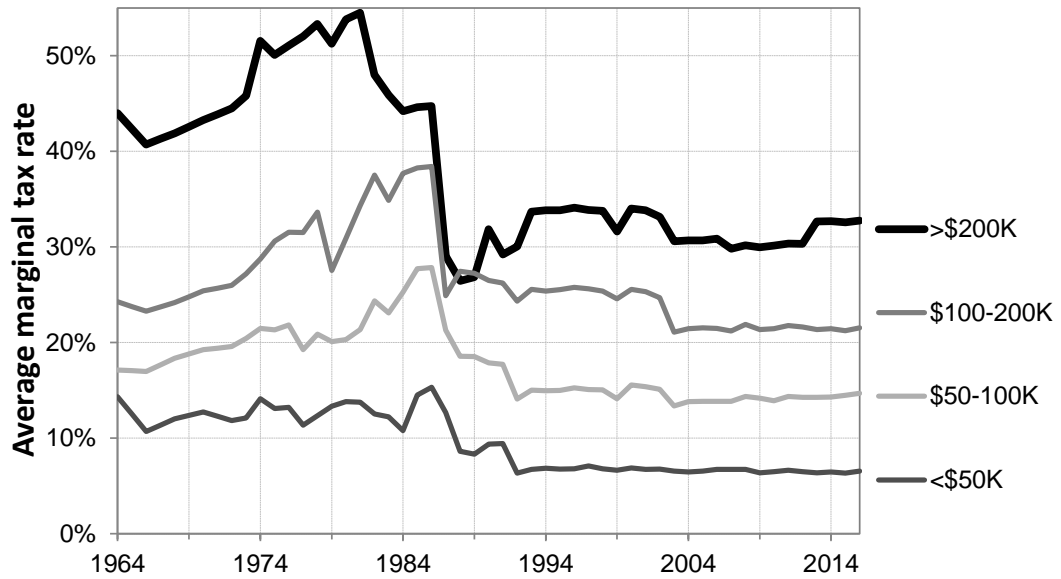
Notes: Income groups are set by real adjusted gross income (2017 dollars, indexed with the CPI-U).

Values are interpolated for 1965, 1967, 1969, and 1971.

Source: Author's calculations using IRS SOI data.

FIGURE 4

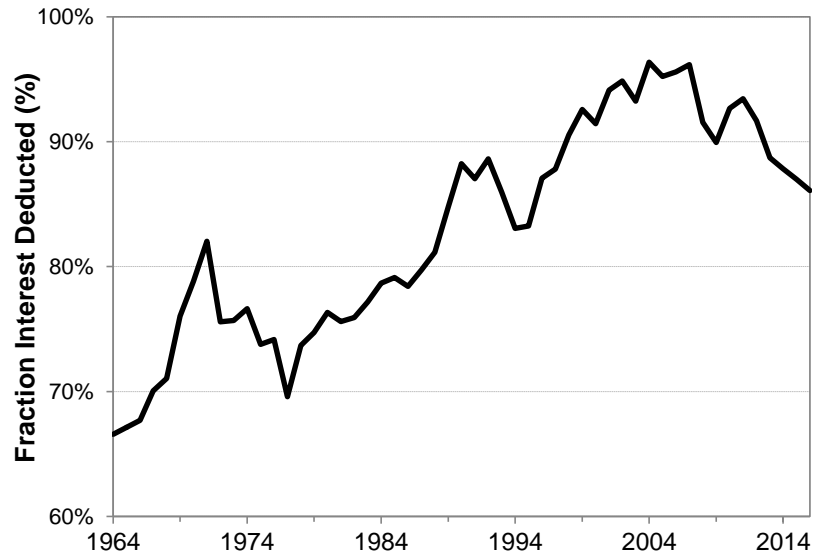
Average marginal tax rates by real income group



Notes: Income groups are set by real adjusted gross income (2017 dollars, indexed with the CPI-U).
Values are interpolated for 1965, 1967, 1969, and 1971.
Source: Author's calculations using IRS SOI data.

FIGURE 5

Fraction Mortgage Interest Deducted

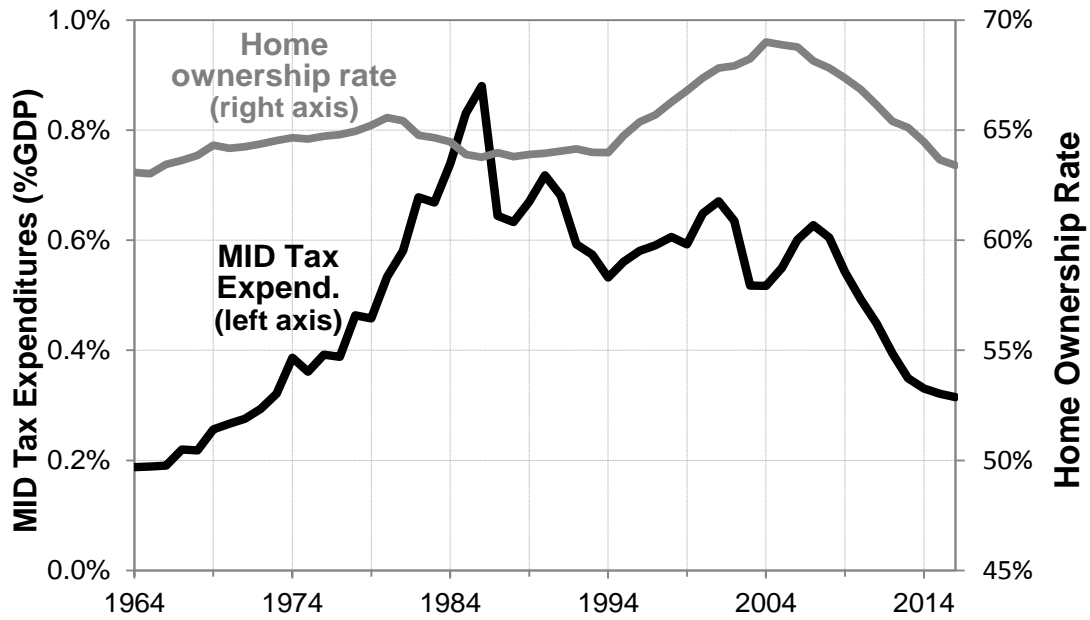


Notes: Only includes mortgage interest for owner-occupied housing.

Sources: U.S. Bureau of Economic Analysis and author's calculations using IRS SOI data.

FIGURE 6

Home ownership rates are uncorrelated with MID tax expenditures



Notes: Correlation = 0.33

Sources: U.S. Census and author's calculations using IRS SOI data.

Appendix

TABLE A1

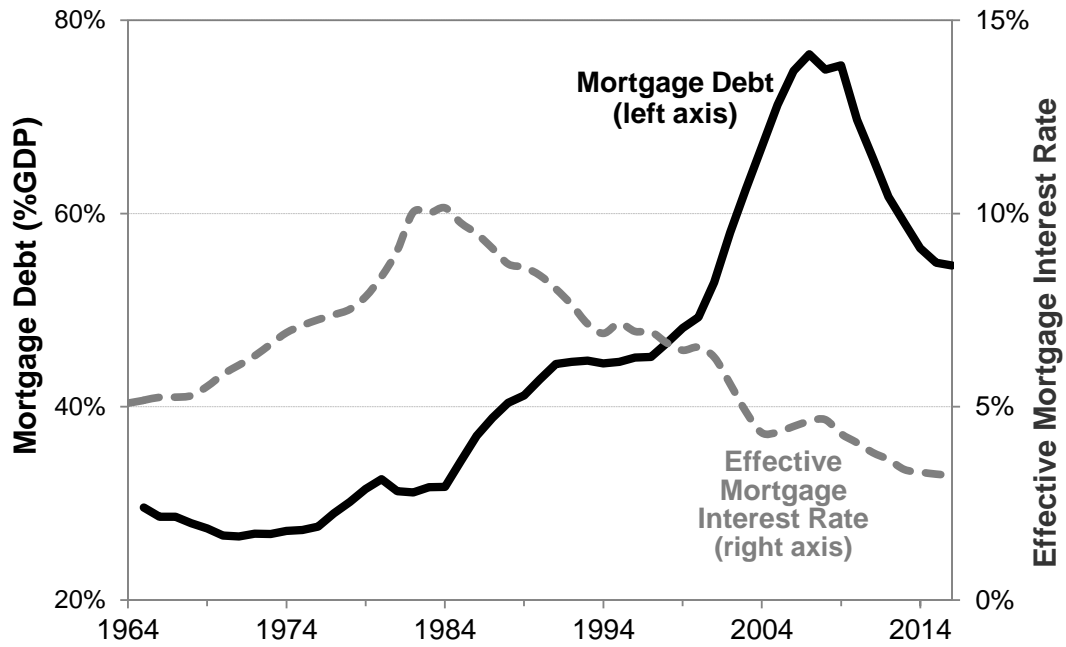
Mortgage interest deduction tax expenditure estimates

| | Nominal (\$billions) | Percent of GDP | | Nominal (\$billions) | Percent of GDP |
|------|---------------------------------|---------------------------|------|---------------------------------|---------------------------|
| 1964 | 1.28 | 0.19 | 1991 | 41.93 | 0.68 |
| 1965 | --- | 0.19 | 1992 | 38.64 | 0.59 |
| 1966 | 1.55 | 0.19 | 1993 | 39.37 | 0.57 |
| 1967 | 1.89 | 0.22 | 1994 | 38.80 | 0.53 |
| 1968 | 2.05 | 0.22 | 1995 | 42.85 | 0.56 |
| 1969 | 2.61 | 0.26 | 1996 | 46.89 | 0.58 |
| 1970 | 2.86 | 0.27 | 1997 | 50.66 | 0.59 |
| 1971 | 3.21 | 0.28 | 1998 | 54.94 | 0.61 |
| 1972 | 3.76 | 0.29 | 1999 | 57.07 | 0.59 |
| 1973 | 4.58 | 0.32 | 2000 | 66.52 | 0.65 |
| 1974 | 5.97 | 0.39 | 2001 | 71.01 | 0.67 |
| 1975 | 6.09 | 0.36 | 2002 | 69.48 | 0.64 |
| 1976 | 7.34 | 0.39 | 2003 | 59.29 | 0.52 |
| 1977 | 8.09 | 0.39 | 2004 | 63.18 | 0.52 |
| 1978 | 10.90 | 0.46 | 2005 | 71.63 | 0.55 |
| 1979 | 12.03 | 0.46 | 2006 | 83.06 | 0.60 |
| 1980 | 15.23 | 0.53 | 2007 | 90.71 | 0.63 |
| 1981 | 18.62 | 0.58 | 2008 | 89.01 | 0.60 |
| 1982 | 22.67 | 0.68 | 2009 | 78.49 | 0.54 |
| 1983 | 24.30 | 0.67 | 2010 | 73.93 | 0.49 |
| 1984 | 29.86 | 0.74 | 2011 | 69.81 | 0.45 |
| 1985 | 36.05 | 0.83 | 2012 | 63.84 | 0.39 |
| 1986 | 40.30 | 0.88 | 2013 | 58.62 | 0.35 |
| 1987 | 31.29 | 0.64 | 2014 | 57.94 | 0.33 |
| 1988 | 33.14 | 0.63 | 2015 | 58.52 | 0.32 |
| 1989 | 37.77 | 0.67 | 2016 | 58.92 | 0.31 |
| 1990 | 42.81 | 0.72 | | | |

Sources: Author's calculations based on IRS SOI data.

FIGURE A1

Mortgage debt and effective mortgage rate



Sources: Federal Reserve home mortgage less construction loans series and author's calculations using IRS SOI data.