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by

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# Who Cares about Mortgage Interest Deductibility?\*

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## Abstract

We use the Survey of Consumer Finances to measure the change in federal tax liability that would result should mortgage interest no longer be deductible from taxable income. We argue that the elimination of this housing tax provision would lead households to reshuffle their balance sheet, thereby lowering the amount of interest income taxes collected. We find that the cost of this tax provision is between 35 and 65 percent of the estimates produced by the Office of Management and Budget, depending on the types of assets one assumes would be used to lower mortgage debt following the removal of the provision. Furthermore, since mostly rich households would be in a position to reshuffle their balance sheet following such a change in tax policy, the distributional effect of this program are much smaller than conventionally believed.

*Journal of Economic Literature* Classification Numbers: E62; G11; H24; H31

*keywords:* Mortgage Interest Deductibility; Housing; Taxation; Redistribution

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# 1 Introduction

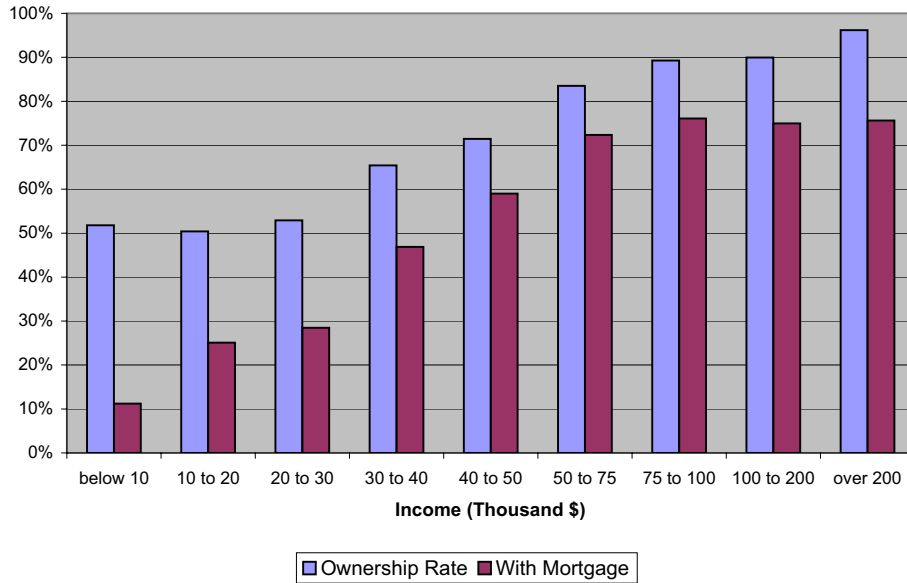
The fact that owner-occupied housing capital receives a preferential tax treatment is well known. One such tax provision which receives a lot of attention is the deductibility of mortgage interest payments from taxable income.<sup>1</sup> There are at least two reasons why mortgage interest deductibility draws such interest from academics and policy makers alike. One is that this tax provision is perceived to be very costly for the government. The Office of Management and Budget estimates that mortgage interest deductibility will cost the government over \$68 billion of revenue losses in 2004, which represents around 8.7% of total individual income tax revenues as projected by the Congressional Budget Office. Second, mortgage interest deductibility is widely perceived to benefit relatively wealthy households at the expense of less fortunate ones (e.g. see Maki (1996)). Not surprisingly, the elimination of this tax provision periodically surfaces in policy debates (for a recent example, see Bourassa and Grigsby (2000)). In this paper, we argue that both the cost and re-distributional effects of mortgage interest deductibility are greatly overstated.

The common belief that mortgage interest deductibility is regressive stems from the fact that home-ownership rates differ considerably across groups of different status (e.g. Poterba (1990)). Using data from the 1998 Survey of Consumer Finances, Figures 1 and 2 show that indeed the home-ownership rate (blue line) increases with income and, to a lesser extent, with wealth. These figures also show that the fraction of households with mortgage debt (red line) is higher for households with relatively high income or wealth, although this fraction levels off in both cases. A similar picture emerges from households who itemize deductions. Glaeser and Shapiro (2003) report that the fraction of itemizers in the top income decile (31 percent) is about 8 times higher than the fraction of itemizers even in the fifth decile of the distribution (4 percent). At first glance these figures lend some support to the conventional view that mortgage interest deductibility mainly benefits wealthy households, as they are

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<sup>1</sup>Mortgage interest deductibility allows taxpayers to deduct qualified interest paid on up to \$1 million in acquisition debt secured by the taxpayer's principal residence and one other residence. Taxpayers may also deduct interest on up to \$100,000 in home equity debt. The total of the acquisition and home equity debt on which the MID is taken cannot exceed the fair market value of the home. See <http://www.irs.gov/publications/p936/ar02.html#d0e175> for a detailed explanation of what qualifies as a mortgage interest deduction.

Figure 1: Home Ownership and Mortgage Incidence by Income



more likely than poor households to be home-owners and have outstanding mortgage debt.

The central idea of this paper is that knowledge of households' entire balance sheet is necessary to make statements about the desirability of allowing mortgage interest deductibility because households would alter their balance sheet if this tax provision were removed.<sup>2</sup> In other words, Figures 1 and 2, on their own, paint an inaccurate picture of the distributional effect of mortgage interest deductibility.

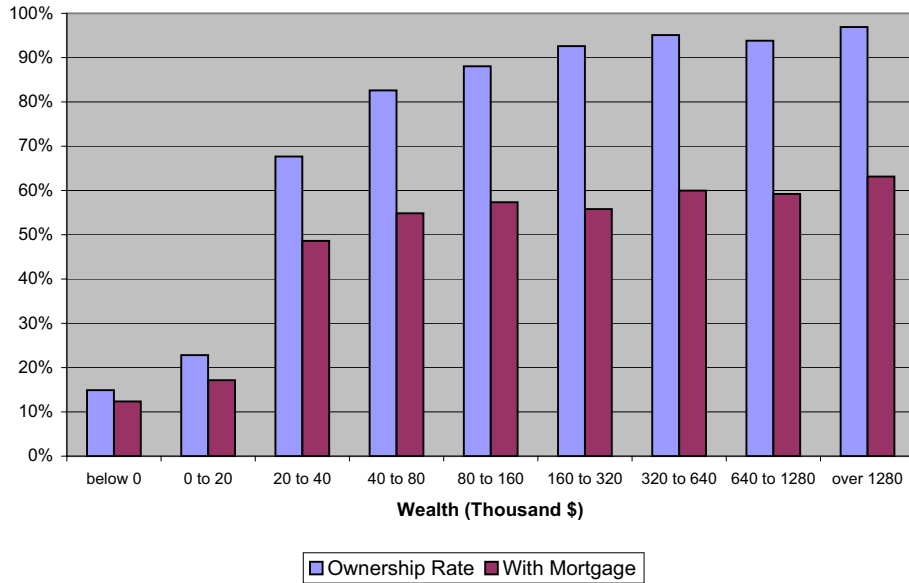
Accordingly, we use the Survey of Consumer Finances (SCF) to identify assets that households would use to lower their mortgage debt if mortgage interest were no longer deductible.<sup>3</sup> Since the revenues generated by these assets are taxable under current tax law, these revenues should be deducted from the cost of running the program.

To gain some confidence in the data available in the SCF, we first undertake the

<sup>2</sup>Skinner and Feenberg (1990) and Maki (1996, 2001) make a similar argument in a different context. Following the 1986 tax reform, which eliminated deductibility of interest paid on consumer debt, households reshuffled their balance sheet by increasing their mortgage debt to pay off their consumer debt.

<sup>3</sup>We use the 1998 SCF because it is the most recent wave of the Survey which has some geographical information.

Figure 2: Home Ownership and Mortgage Incidence by Wealth



calculation of the cost of mortgage interest deductibility using the simple method used by the Office of Management and Budget (OMB), which is given by the difference between total Federal tax liability with and without the tax provision. To do so, we compute the tax liability for each household in the SCF using the NBER TaxSim model (for fiscal year 1997) with and without the deduction.<sup>4</sup> Our estimate of the cost of mortgage interest deductibility (MID) for 1997 is around \$52 billion, which is less than two percent lower than the \$53 billion figure reported by the OMB for fiscal year 1997. As a by-product, TaxSim reports an estimate of each household’s marginal tax rate at the Federal level. Using these marginal tax rates together with each household’s reported mortgage interest payment in the SCF, we can obtain another measure of the cost of MID simply by adding up each household’s cost. This simple measure, at \$50 billion, is sufficiently close to the IRS number to conclude that changes in marginal tax rates, which is ignored by this latter measure, are of second order.

A better measure of the cost of MID would take into account the fact that households would use some of their assets to pay off their mortgage debt should mortgage

<sup>4</sup>The income data contained in the SCF is sufficiently detailed to compute each household’s tax liability using NBER’s TaxSim model. See Appendix C for details on the accuracy of SCF data for tax purposes. See Feenberg and Coutts (1993) for information on the TaxSim model.

interest no longer be deductible. Since the government would lose the taxes collected on the interest generated by these assets, these taxes can be thought of as tax revenues made possible by mortgage interest deductibility. As such, this tax revenue should be deducted from the conventional (OMB) cost of this tax provision. We propose three such measures. Our first measure assumes that all non-pension wealth would be used to pay off mortgage debt if MID were eliminated. The cost of the program under this measure is under \$20 billion, which is less than 40 percent of the conventional measure. Under a more conservative measure, which assumes that only taxable financial assets other than liquid assets would be used to offset mortgage debt, the cost is still less than 65 percent of the conventional measure. Our preferred measure, which excludes all assets whose return may be either untaxed or tax-differed, is around 60 percent of the OMB figure.

We also characterize who benefits from mortgage interest deductibility. As one would expect, our measures show significantly less of the benefits of this program going to wealthy households than the conventional measure: they are the households best equipped to pay off their mortgage once the tax advantage is removed. Contrary to the conventional measure, for which the benefits from MID increase with wealth, our preferred measure suggests that MID does not benefit richer households any more than the median wealth household. We also show that while the benefits of mortgage interest deductibility increase with income, they do not increase as fast as taxes paid for relatively high income levels. We thus find that mortgage interest deductibility makes the tax code less progressive at relatively low levels of income and more progressive for relatively high levels of income. We also show that mortgage interest deductibility is particularly important for new home buyers, a pattern that does not emerge with the conventional measure.

One aspect that we do not consider in this paper is that in addition to reshuffling their balance sheet, households could also change their housing tenure choice following the removal of mortgage interest deductibility. However, simulation results in Gervais (2002) imply that mortgage interest deductibility is relatively unimportant for the tenure decision: the home-ownership rate is only 4 percentage points higher in an economy with mortgage interest deductibility relative to an economy without the deduction.<sup>5</sup> Consistent with our results, mortgage interest deductibility is relatively

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<sup>5</sup>Berkovec and Fullerton (1992) also study the impact of housing subsidies in a general equilibrium

important for new home owners, who purchase their first house at a younger age when mortgage interest payments are deductible. Similarly, Glaeser and Shapiro (2003) argue that mortgage interest deductibility is unlikely to have much of an impact on the home-ownership rate, and conclude that it is a poor instrument if the goal of the program is to increase the home-ownership rate.<sup>6</sup>

Follain and Melamed (1998) also argue that the OMB overstates the amount of revenue the government loses due to mortgage interest deductibility.<sup>7</sup> Unlike Follain and Melamed (1998), who use a reduced-form demand for mortgage debt developed in Follain and Dunskey (1997) to estimate the tax elasticity of the demand for mortgage in order to estimate the cost of mortgage interest deductibility, we use SCF data directly to infer the degree to which each household would reshuffle their balance sheet if the deduction were removed. In addition to being easier to implement, our approach is also much more transparent as it follows directly from a standard specification of households' budget constraint. Furthermore, a proxy for our measure of government revenue loss can readily be constructed by the IRS using a flow approach which closely tracks our stock or balance sheet approach.

The rest of this paper is organized as follows. The next section discusses the reasons why measuring the cost of mortgage interest deductibility, or for that matter measuring any tax expenditure, is a difficult task. Our measures of the cost of mortgage interest deductibility are presented in Section 3, and distributional effects are discussed in Section 4. In section 5 we present indirect evidence in favor of our measures by using data from Canada, where mortgage interest payments are not deductible. Concluding remarks are offered in section 6.

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model, but in a static environment.

<sup>6</sup>Indeed, Maki (2001) writes that because Congress “determined that encouraging home ownership is an important policy goal, achieved in part by providing a deduction for residential mortgage interest,” it chose to retain the residential mortgage interest deduction (Joint Committee on Taxation, 1987 pp. 263–64) while it eliminated interest deduction on all other consumer loans.

<sup>7</sup>Capozza et al. (1996) argue that the removal of housing tax subsidies would have a large impact on mortgage borrowing as well as house prices.



Table 1: Income Tax Expenditures (2004)

Rank	Provision	Cost (\$m)
1	Exclusion of employer contributions for medical insurance premiums and medical care	120,160
<b>2</b>	<b>Deductibility of mortgage interest on owner-occupied homes</b>	<b>68,440</b>
3	Net exclusion of pension contributions and earnings: Employer plans	67,870
4	Net exclusion of pension contributions and earnings: 401(k) plans	55,290
5	Capital gains (except agriculture, timber, iron ore, and coal)	53,930

Source: U.S. Office of Management and Budget (2003)

## 2 Mortgage Interest Deductibility: A Tax Expenditure

The Congressional Budget Act of 1974 defines tax expenditures 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 Budget Act also requires that a list of tax expenditures be included in the annual budget. As Table 1 shows, mortgage interest deductibility was the second most important tax expenditure as reported by the Office of Management and Budget for 2004.

Although the Budget Act requires disclosure of tax expenditures, it offers little guidance as to how to measure tax expenditures. Broadly speaking, tax expenditures are measured as the difference between the tax liability under present law and the tax liability that would result from a re-computation of the tax liability without benefit of the tax provision. There are obvious issues in measuring any tax expenditure.<sup>8</sup> Two such issues are particularly important for mortgage interest deductibility. First,

<sup>8</sup>In fact, the Bush Administration’s 2002 budget stated that “...the Administration believes the meaningfulness of tax expenditure estimates is uncertain...” [Office of Management and Budget, 2002] and promised a new more meaningful presentation in future years.

the concept of tax expenditures relies on the existence of a ‘normal’ tax code, one which does not have such provisions. For instance, if we defined a normal tax system as one where the implicit revenue from owner-occupied housing (imputed rents) is taxed, then mortgage interest deductibility no longer constitutes a tax expenditure, as long as one accepts that interest on loans acquired to generate a revenue should be deductible against that revenue. Although this issue is of obvious importance, it is not the subject of this paper.<sup>9</sup>

A second issue is that strong assumptions on behavior need to be made in order to measure tax expenditures. In particular, the numbers published by the OMB assume that individual behavior remains unchanged once a tax provision is removed. In this paper, we argue that plausible changes in behavior upon the elimination of mortgage interest deductibility paint a very different picture from that suggested by Table 1.

Our argument is very simple: since mortgage debt can be used, explicitly or implicitly, to purchase non-housing assets which generate taxable income, households would reshuffle their balance sheet using these assets to payoff (at least part of) their mortgage debt upon the removal of mortgage interest deductibility. In other words, the income generated by these assets reduces the cost of allowing mortgage interest deductibility.

As an example, consider two households with balance sheets given below. In standard models, in which the borrowing and lending rates are equal, households are indifferent between either one of these balance sheets as long as mortgage interest payments are deductible. However, these two balance sheets would lead to very different costs of MID using the OMB measure. This is because household A has an outstanding mortgage of \$50,000, which, at an interest rate of 10% and a tax rate of 20% appears to cost the government \$1000 of tax revenues. Of course, this calculation omits the fact that this mortgage debt is implicitly used to hold \$50,000 worth of non-residential assets generating \$5000 of revenues which, if also taxed at 20%, completely offsets the mortgage deduction. Put differently, household A would sell off \$50,000 worth of non-residential assets if mortgage interest payments were no

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<sup>9</sup>Gervais (2002) argues that this tax advantage is far more important than mortgage interest deductibility to explain households’ tenure decision. Ling and McGill (1993) argues that the failure to tax imputed rents involves much more revenue losses for the government than allowing mortgage interest deductibility.

Table 2: Balance Sheets for Household A and Household B

Balance Sheet A		Balance Sheet B	
House	Mrtg debt	House	Mrtg debt
$h = 200,000$	$b = 50,000$	$h = 200,000$	$b = 0$
Non-res assets		Non-res assets	
$a = 100,000$		$a = 50,000$	
	Net worth		Net worth
	$y = 250,000$		$y = 250,000$

longer deductible.

In what follows we formalize this idea by computing the cost of mortgage interest deductibility, still in terms of government revenue losses, under different assumptions regarding the type of assets that individuals would use to lower their mortgage debt if the provision were eliminated.

### 3 Measuring the Cost of Mortgage Interest Deductibility

In this section we evaluate the amount of revenue the government foregoes by allowing home owners to deduct mortgage interest payments from taxable income. We compute four different measures of the revenue loss for the government. Our first measure, which we refer to as the conventional measure, is based on the calculations undertaken by the OMB to measure various tax expenditures. Accordingly, this measure assumes that households would not respond in any way following the removal of mortgage interest deductibility. Clearly, this measure constitutes an upper bound for the cost of MID, as one would expect households to alter their balance sheet to reduce their outstanding mortgage debt. Hence we propose three measures that differ in their assumptions about how households would adjust their balance sheets to reduce their outstanding mortgage debt following the removal of mortgage interest deductibility. All three measures are computed under the assumption that households face the same

exogenously given interest rate on borrowing and lending.<sup>10</sup> For all measures marginal income tax rates are household specific and are calculated using the TaxSim model.<sup>11</sup> Of course, all calculations are for households who itemize their deduction, as the revenue loss to the government for non-itemizing households is zero.<sup>12</sup> However, our measures do take into account the fact that some households may no longer choose to itemize their deductions once mortgage interest deductibility is removed.

To fix ideas, consider an age- $j$  household (indexed  $k$ ) who's current net wealth, denoted  $y_j^k$ , is composed of housing asset  $h_j^k$ , of which  $b_j^k < h_j^k$  is mortgaged, and net non-housing assets worth  $a_j^k$ , so that  $y_j^k = a_j^k + h_j^k - b_j^k$ . The budget constraint of this household is given by

$$c_j^k + px_j^k + y_{j+1}^k = w_j^k + (1+i)a_j^k + (1+i^h)h_j^k - (1+i)b_j^k - \tau_j^k(w_j^k + i a_j^k - i b_j^k) \quad (1)$$

where  $c_j^k$  is consumption;  $px_j^k$  is the value of housing services consumed;  $w_j^k$  is wage income,  $i$  is the common lending and borrowing interest rate, and  $i^h$  is the implicit interest income on owner-occupied housing capital (imputed rents).<sup>13</sup> The last term of this budget constraint corresponds to a tax code in which mortgage interest payments are fully deductible from taxable income—composed of interest and labor income—which is taxed at rate  $\tau_j^k$ .

Notice that both balance sheets in Table 2 would produce identical budget constraints according to equation (1). It is also interesting to note that since the Internal Revenue Service (IRS) necessarily collects data on both interest income ( $ia$ ) and mortgage interest payments ( $ib$ ), it could easily compute the amount of mortgage interest that is offset by interest income. The approach we develop below, which is based on the balance sheet rather than the flow of income, is equivalent to this flow

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<sup>10</sup>This is a conservative assumption, in the sense that assuming a (positive) wedge between the lending and borrowing interest rates would only serve to lower our measures of the cost of mortgage interest deductibility.

<sup>11</sup>See Appendix C for details on how we compute tax rates. See Feenberg and Coutts (1993) for details about the TaxSim model.

<sup>12</sup>According to the US tax code a household itemizes its deductions if total itemized deductions are greater than the standard deduction allowed for the household. Standard deductions depend on the tax filing status of households. For the tax year 1997 standard deductions were as follows: Single household \$4,150. Married filing jointly \$6,900, Head of household \$6,050. We assume that all married households file taxes jointly.

<sup>13</sup>Without depreciation, imputed rents correspond to the value of housing services, so these terms cancel out for home owners.

approach under the assumption of a common borrowing and lending interest rate. We use a balance sheet approach since assets and liabilities are better measured in SCF data than interest income (see Appendix C).

### 3.1 Conventional Measure

The conventional measure of the revenue loss to the government is the difference between the total taxes that would be collected without allowing for MID and total taxes that are collected with MID. This is indeed how the OMB arrives at the conclusion that government revenue losses due to MID was around \$53.08 billion in 1997. Using our sample from the SCF for 1998 (tax year 1997), we use TaxSim to compute total tax liabilities with and without MID. Doing so, our conventional measure of the revenue loss due to MID is \$52.13 billion, which is very close to the revenue loss reported by the OMB.<sup>14</sup>

Notice that if households' marginal tax rates were unaffected by this change in the tax code, then we could compute the conventional measure simply by adding up each household's deduction times their marginal tax rate:

$$C = \sum_k \tau^k \times (i \times b)^k, \quad (2)$$

where  $(i \times b)^k$  is taken from the SCF and  $\tau^k$  is TaxSim's estimate of household  $k$ 's marginal federal tax rate.<sup>15</sup> Doing so results in a cost of \$50.03 billion, which is very close to the \$52.13 billion figure we obtained above. We conclude that changes in marginal tax rates are of second order, and assume for our three measures below that marginal tax rates remain constant following the removal of MID.

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<sup>14</sup>Unfortunately, the SCF does not report households' state of residence, which is important for tax calculations in general, but especially crucial for mortgage interest deductibility calculations. To circumvent this problem, we use the 1998 version of the SCF, which is the most recent wave of the Survey for which households reported their census region. We use this information to compute tax liabilities and tax rates for each state in which a household could reside. We then use a population weighted average to get our estimates of each household's tax liability and tax rate. See Appendix A for details.

<sup>15</sup>The SCF is sufficiently detailed for us to compute outstanding mortgages for each household as the sum of the remaining mortgage on the principal residence and one other residence, as specified by the tax law (see footnote 1). For households with more than two residences, the second residence is the one with the highest mortgage interest payment.

### 3.2 Alternative Measures

Our approach is based on households' balance sheet. Under full mortgage interest deductibility, the budget constraint (1) can be written as

$$c_j^k + px_j^k + y_{j+1}^k = (1 - \tau_j^k)w_j^k + y_j^k + i^h h_j^k + (1 - \tau_j^k) i (a_j^k - b_j^k). \quad (3)$$

The last term in (3) implies that households are indifferent between many different balance sheets: as long as the same interest rate applies to borrowing and savings, households only care about non-housing assets net of mortgage debt, as opposed to the exact composition of their balance sheet. Furthermore, if we assume that all assets are taxed at the same rate, government revenues are also unaffected by the composition of assets and liabilities.

More precisely, the argument is that if household  $k$ 's net worth is large enough for this household to own its house outright ( $y^k > h^k$  or equivalently if  $a^k > b^k$ ), then the entire mortgage is implicitly used to finance other assets. Since these assets generate income  $i a^k$  which is taxed at rate  $\tau^k$ , the OMB overstates the cost of MID by  $\tau^k \times i \times b^k$ , as this household's assets generate taxable revenues that exactly offset its mortgage deduction. Similarly, if a household's net worth is insufficient to own its house outright ( $a^k < b^k$ ), then the miscalculation consists of the revenues on non-housing assets held by the household, that is,  $\tau^k \times i \times a^k$ . The aggregate miscalculation, then, is given by

$$\Delta = \sum_{\{k|a^k \geq b^k\}} \tau^k \times i \times b^k + \sum_{\{k|a^k < b^k\}} \tau^k \times i \times a^k, \quad (4)$$

and government revenue losses are given by

$$C^* = \sum_{\{k|a^k < b^k\}} \tau^k i (b^k - a^k). \quad (5)$$

Ideally, one would like to know the exact amount of revenues generated by each component of households' balance sheet. Unfortunately, the SCF does not provide such information. Instead, we specify a set of assets which we assume generate interest income at a common interest rate  $i$ , while all other assets are assumed to generate tax-free revenues. Only the former assets are included when we compute our measure

Table 3: Balance Sheet: Inclusive Measure

Assets	Liabilities
Financial assets	Mortgage debt
✓ Liquidity	Principal residence
✓ CDS and NMMF	Second residence
✓ Stocks and bonds	
Retirement assets	
✓ Other financial assets	
Non-financial assets	Other debt
Vehicles	✓ Other lines of credit
House(s)	✓ Loans
✓ Business (net worth)	✓ Other debt
✓ Other residential assets	
✓ Net non-residential equity	
✓ Other (net) non-financial assets	Net worth

of government revenue losses  $C^*$  in (5), as only these assets would be used to lower mortgage debt if the deduction were eliminated.<sup>16</sup> Our three measures below differ as to which assets fall into each category. To implement these measures, we set the interest rate such that government revenue losses in equation (2) under that common interest rate is equal to the conventional measure of the revenue loss computed above (\$50.03 billion). The interest rate works out to be 7.29%.

Table 3 shows the components of the balance sheet that we construct for each household in the the SCF, along with the elements of our most comprehensive measure of interest bearing assets identified by a check mark. For this inclusive measure, we define interest bearing asset ( $a^k$ ) as all (net) non-housing assets other than vehicles and assets accumulated for retirement purposes (such as 401k and thrift accounts).<sup>17</sup> We think of this measure as a lower bound on the revenue loss to the government from

<sup>16</sup>For practical purposes, the cost for each household  $k$  is given by  $C^{*k} = C^k + \Delta^k$ , where  $\Delta^k = \tau^k \times (i \times b)^k$  if  $a^k \geq b^k$  or  $\Delta^k = \tau^k \times i \times a^k$  if  $a^k < b^k$ . In other words, we use the household specific mortgage interest rate as it is available in the SCF, but use the common interest rate  $i$  for asset income as this interest rate is not available in the data.

<sup>17</sup>Engen and Gale (1997) show that the rise in 401(k) assets among home owners was associated with a rise in mortgage borrowing. Accordingly, they argue that the increase in mortgage credit could have emanated from the increased availability of tax-sheltered savings plans rather than the loss of interest deductibility on consumer loans.

Table 4: Balance Sheet: Preferred Measure

Assets	Liabilities
Financial assets	Mortgage debt
Liquidity	Principal residence
✓ CDS and NMMF	Second residence
✓ Stocks and bonds	
Retirement assets	
✓ Other financial assets	
Non-financial assets	Other debt
Vehicles	Other lines of credit
House(s)	Loans
Business (net worth)	Other debt
Other residential assets	
✓ Net non-residential equity	
✓ Other (net) non-financial assets	Net worth

providing tax payers with mortgage interest deductibility as it assumes that the vast majority of assets that are acquired through mortgage debt generate taxable income and would be used to lower mortgage debt if MID were eliminated.

Our second definition of interest bearing assets only includes non-liquid, taxable financial assets (excluding financial assets accumulated for retirement) plus net non-residential real estate assets and other (net) non-financial assets (see Table 4). This measure, our preferred measure, excludes assets whose returns may be untaxed in the short run or tax-differed. We chose to exclude business assets as we believe that, although households may borrow against their house to finance their business interests, it is unlikely that they would sell their business interests to reduce their outstanding mortgage in the absence of mortgage interest deductibility. Similarly, we excluded liquid assets as these assets may serve purposes other than generating interest income.

Our third and last definition of interest bearing assets only consists of non-liquid, taxable financial assets. Relative to our preferred measure, this measure removes non-financial assets from the set of assets with taxable revenues. We consider this to be a fairly conservative measure of interest bearing assets that could be used to lower



Table 5: Revenue Loss from Mortgage Interest Deductibility

	Conventional	Conservative	Preferred	Inclusive
Cost of MID (\$ billion)	50.03	32.91	29.18	18.15
Relative Federal Tax (%)	5.71	3.76	3.33	2.07
Relative Total Tax (%)	4.82	3.17	2.81	1.75
Loan to Value ratio (%)	40.28	31.84	29.94	21.69
Mrtg Debt to GDP ratio (%)	46.81	33.32	30.45	20.51

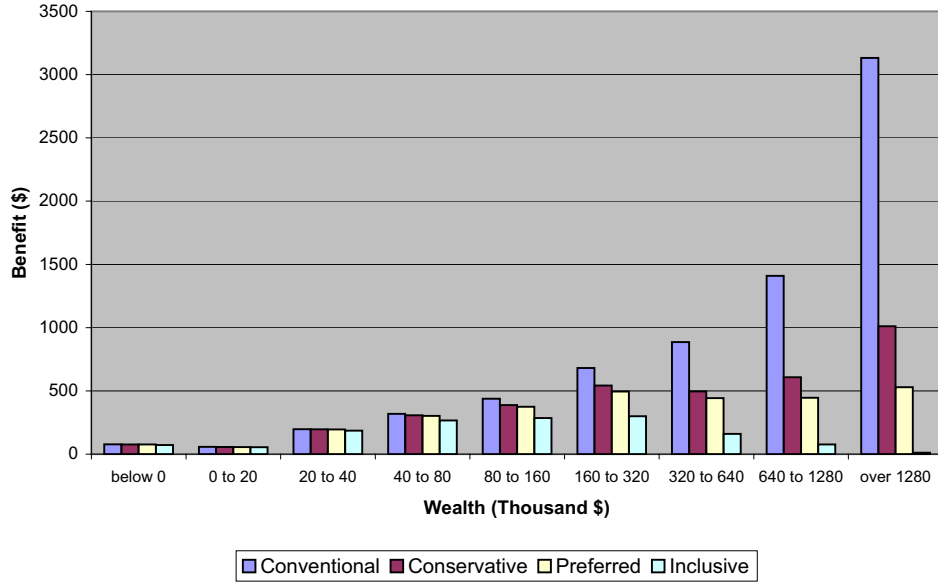
mortgage debt, and so will its corresponding revenue loss measure.

Table 5 reports our estimates of government revenue losses from mortgage interest deductibility for each measure. Depending on the definition of interest bearing assets, the revenue loss for the government is between 17.88 and 32.41 billion dollars, that is, between 36% and 65% of the conventionally measured revenue loss. Even relative to our conservative measure, the conventional measure greatly overstates the revenue loss from this program. Table 5 also presents the percentage increase in tax revenues the government should expect following the elimination of mortgage interest deductibility. According to our preferred measure, Federal tax revenues would increase by about 3.3 percent which, although substantial, is more than two percentage points below the conventional estimate.

The last two rows of Table 5 report the loan-to-value (LTV) ratios and mortgage debt to GDP ratios that obtain following the removal of mortgage interest deductibility under the four measures. The actual LTV ratio for 1997, which obtains under the conventional measure, was just above 40 percent. Under our preferred measure, the LTV ratio is around 30 percent. It is interesting to note that the LTV ratio in Canada, where mortgage interest is not deductible, was around 27.5 percent in 1999.<sup>18</sup> Similarly, mortgage debt to GDP in Canada in 1999 was between 30.7 percent (for mortgage debt on principal residences) and 35.5 percent (for total mortgage debt), which is close to the 30.45 percent we obtain under our preferred measure. We will present more evidence from Canadian data in section 5.

<sup>18</sup>This number is computed from the Canadian Survey of Financial Security.

Figure 3: Distribution of Benefits of MID by Wealth



## 4 Distributional Effects of MID

In this section we study how government revenue losses from mortgage interest deductibility are distributed. We show that while the level of the benefit is strictly increasing in wealth using the conventional measure, these benefits are relatively constant for our preferred measure. Our preferred measure also suggests that although the benefits from MID are increasing in income, they do not increase as fast as tax liabilities. Accordingly, we argue that mortgage interest deductibility does not decrease the degree of progressivity of the tax code, contradicting the conventional wisdom that this program is highly regressive.

Figure 3 depicts the benefits from mortgage interest deductibility across the wealth (net worth) distribution for our four measures. According to the conventional measure, benefits from MID increase exponentially with wealth. This figure evidently lends support to the popular belief that mortgage interest deductibility benefits rich households. However, our preferred measure is only increasing in wealth for relatively poor households. For households above the second quintile of the wealth distribution, that is for households with wealth above \$40,000, benefits are essentially flat. Indeed, our inclusive measure is decreasing in wealth for households above median wealth.

Figure 4: Distribution of Benefits of MID by Income

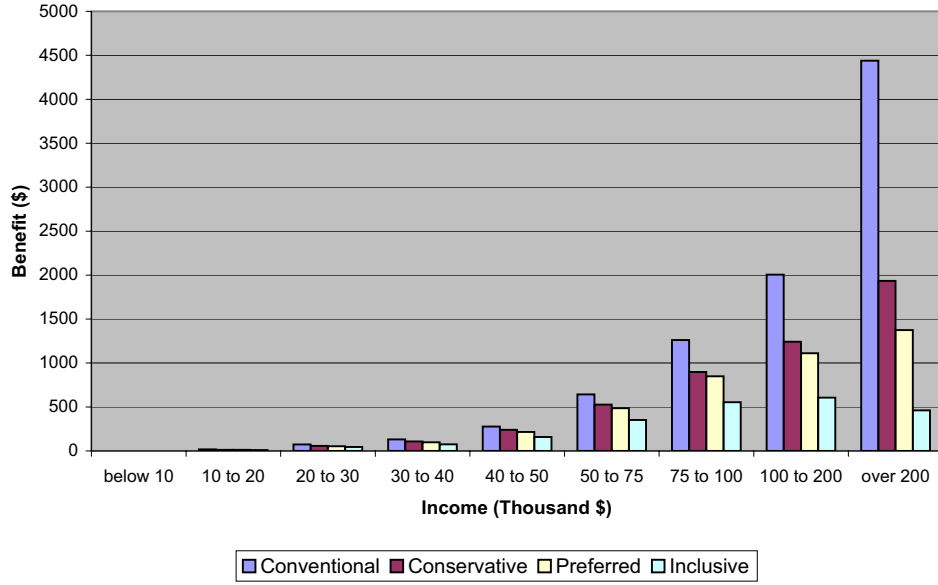
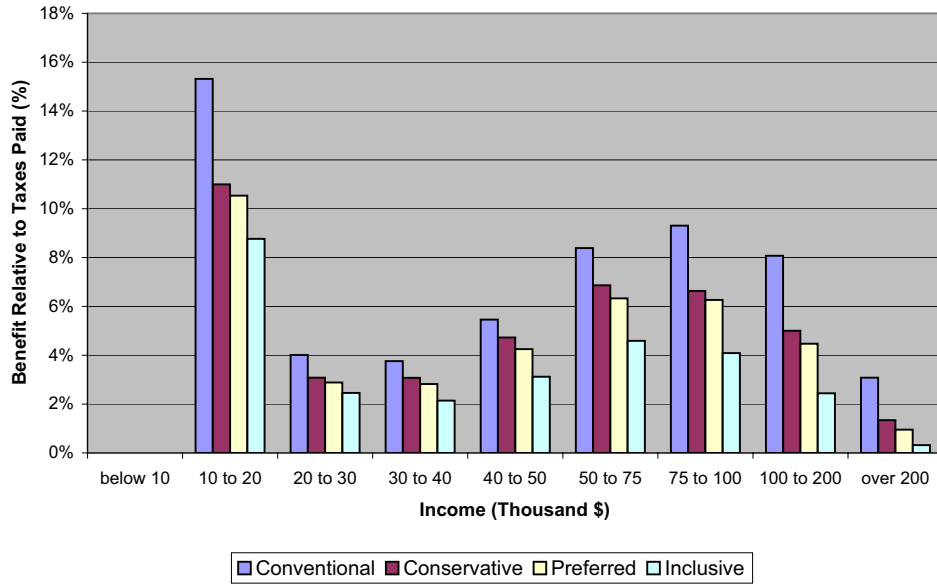


Figure 4 depicts the benefits from mortgage interest deductibility across the income (AGI) distribution for our four measures. While all measures of the benefits increase with income, the increase is much less pronounced according to our preferred measure than the conventional one. The average benefit for households with income above \$200,000 is more than 30 times the average benefit for households with income between \$30,000 to \$40,000 using the conventional measure. For our preferred and inclusive measures respectively, this number is 14 and 6 times the average benefit for households with income between \$30,000 to \$40,000.

An interesting and recurring question in the literature is whether mortgage interest deductibility increases or decreases the degree of progressivity of the U.S. tax code. Figure 5 plots the benefits of MID relative to taxes paid across the income distribution.<sup>19</sup> This figure shows that for all but the conventional measure, while the benefits from MID increase with income, they do not increase as fast as federal taxes paid for income above \$50,000. In other words, mortgage interest deductibility makes the tax code less progressive at relatively low levels of income, and more progressive for relatively high levels of income. It is interesting to note that even for the con-

<sup>19</sup>Households with income between \$10,000 and \$20,000 are mainly retired individuals. For the working age population, households in this income range pay negative taxes on average, just like households with income below \$10,000, for whom we set the relative benefit to zero in Figure 5.

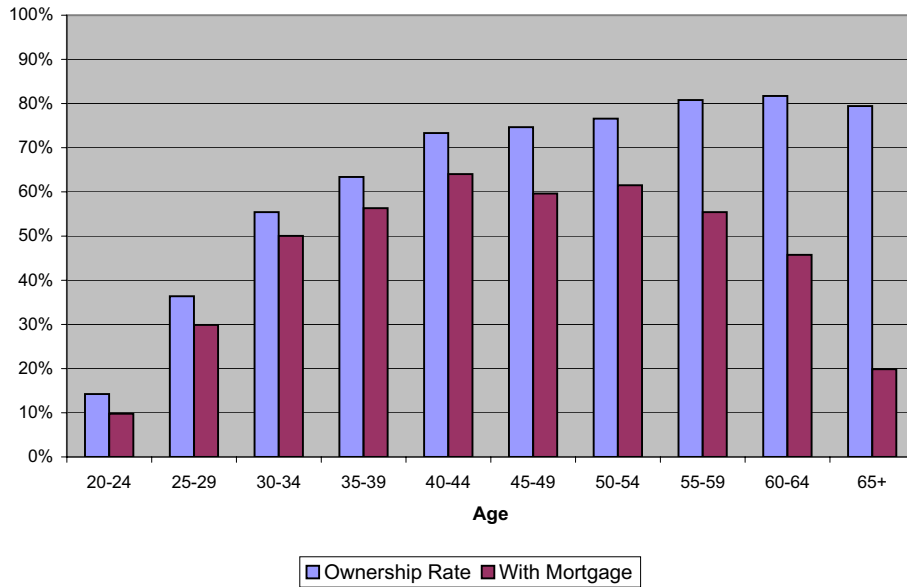
Figure 5: Distribution of Benefits of MID Relative to Federal Taxes Paid



ventional measure, mortgage interest deductibility does not make the tax system less progressive at all income levels.

One would also expect new home owners to care more about mortgage interest deductibility than households who have long been home owners. Figure 6 plots the home ownership rate by age, as well as the fraction of households with mortgage debt. The home ownership rate increases rapidly until age 40, after which it remains stable around 75 to 80%. While the fraction of households with positive mortgage debt increases more or less at the same rate as the home ownership rate, this fraction declines steadily after age 40–44. This seems to suggest that younger and potentially new home owners rely more heavily on mortgage debt than their older counterparts. To examine the extent to which mortgage interest deductibility matters for home owners of different ages, Figure 7 depicts the benefits from mortgage interest deductibility for home owners of different ages. This figure clearly shows that the conventional measure misses the importance of mortgage interest deductibility for new home buyers. By contrast, all three of our measures indicate that MID benefits increase as the home ownership rate increases and declines thereafter. Our measures thus suggest that new home buyers, who rely heavily on mortgage debt to finance their first house, care much more about mortgage interest deductibility than older home owners, a pattern

Figure 6: Home Ownership and Mortgage Incidence by Age



which does not emerge from the conventional measure.

## 5 Evidence from Canadian Data

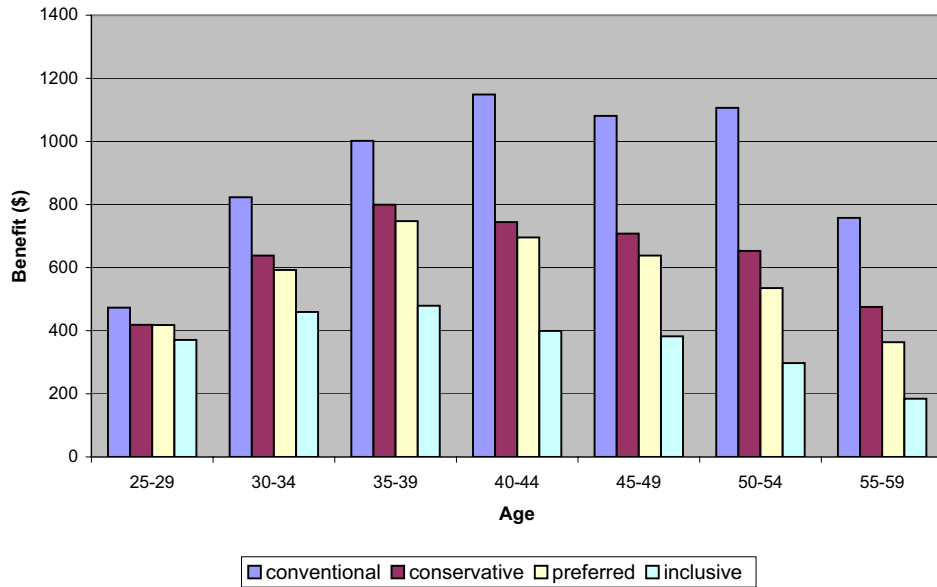
As we eluded to earlier, mortgage interest payments are not deductible in Canada. Although there are many differences between the Canadian and the U.S. tax systems, we can nevertheless use Canadian data to gain some confidence into our measures of the cost and distributional effect of removing mortgage interest deductibility. We do so by using the 1999 Canadian Survey of Financial Securities (SFS), which contains data similar to that found in the SCF.

To begin, the home ownership rate in Canada has been comparable to that of the U.S. in recent years. For example, the home ownership rate in Canada went from 63.6% in 1996 to 65.8% in 2001, while it increased from 65.4% to 67.8% during the same period in the U.S..<sup>20</sup> The home ownership rate in the SFS however is only 60.4%. Meanwhile, the incidence of mortgage debt in the Survey is 32.7%, that is, a little over half (54.1%) of home owners in the Survey have outstanding mortgage debt. In the

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<sup>20</sup>Home ownership rates for Canada are from Census data.

Figure 7: Distribution of Benefits of MID by Age for Home Owners



the SCF, where the home ownership rate is 66.3%, the incidence of mortgage debt is 43.5%, that is, 65.6% of home owners in the Survey have outstanding mortgage debt. Figures 8 and 9 respectively depict the Canadian home ownership rate and mortgage incidence by income and wealth—the Canadian counterparts of Figures 1 and 2 for the U.S..<sup>21</sup> Notice that while the home ownership rate in Canada is much lower at low levels of income (or wealth), they converge for higher levels of income (or wealth). In contrast to the U.S., however, mortgage incidence displays a hump for Canada. These Figures thus show that high income and especially wealthier Canadian households are much less likely to have outstanding mortgage debt than their U.S. counterparts.

Figures 10 and 11 depict, according to our measures, the fraction of households with outstanding mortgage debt that would result if mortgage interest deductibility were removed, by income and wealth respectively. Both Figures show that for all three measures the fraction of households with mortgage debt peaks and then declines. These Figures look remarkably similar to those for Canada (Figures 8 and 9), both for income and wealth.

Table 6 provides further evidence that unlike home owners in the U.S., Canadian

<sup>21</sup>We use the real exchange rate from the Penn World Table 6.1 to convert income and wealth for households in the SFS into U.S. dollars, and the CPI to deflate them back to 1997.

Figure 8: Home Ownership and Mortgage Incidence by Income for Canada

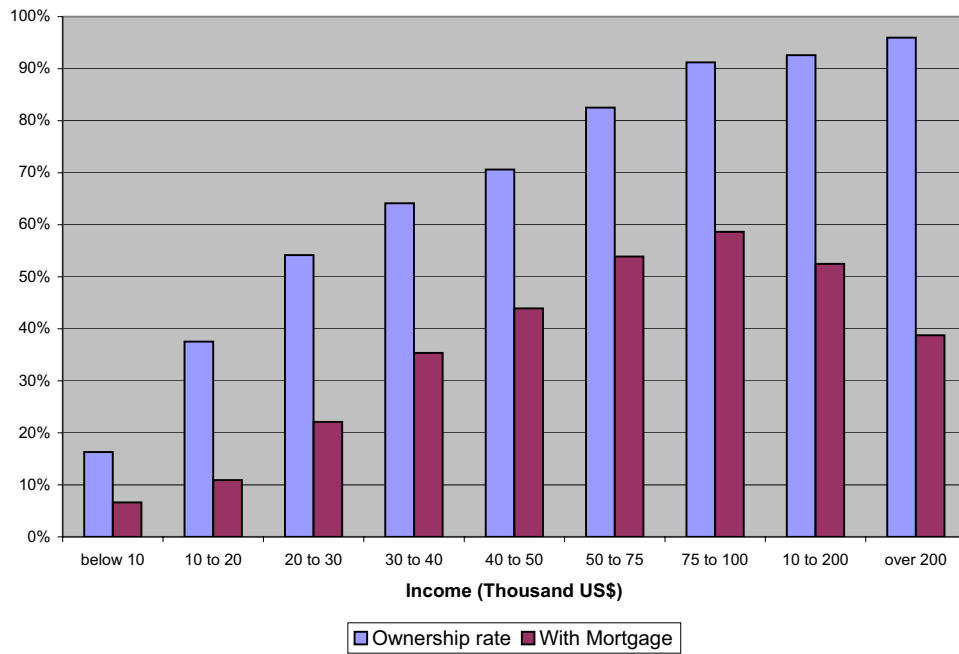


Figure 9: Home Ownership and Mortgage Incidence by Wealth for Canada

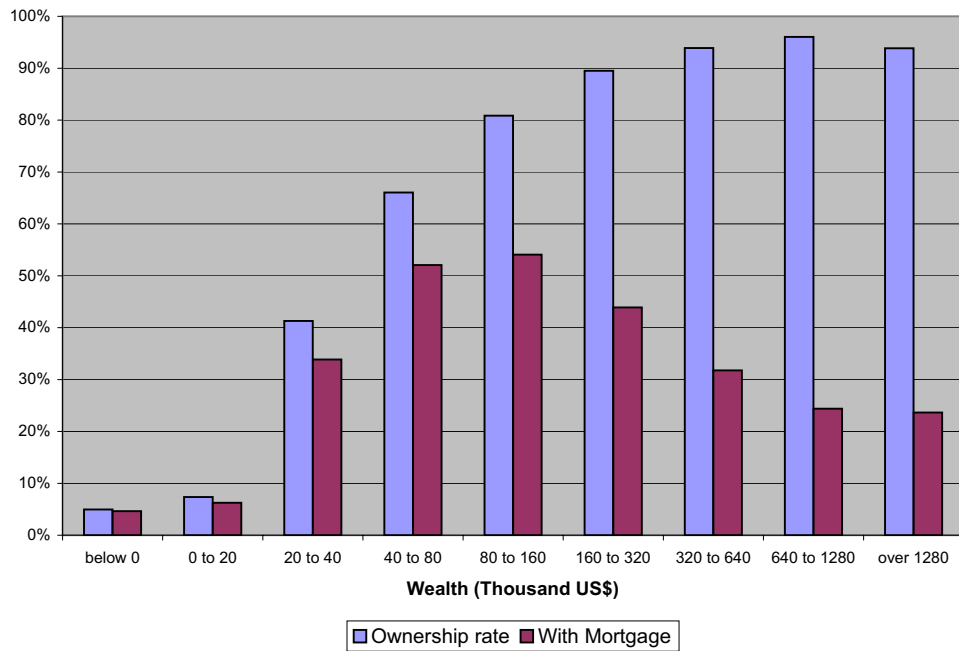


Figure 10: Mortgage Incidence by Income after Reshuffling

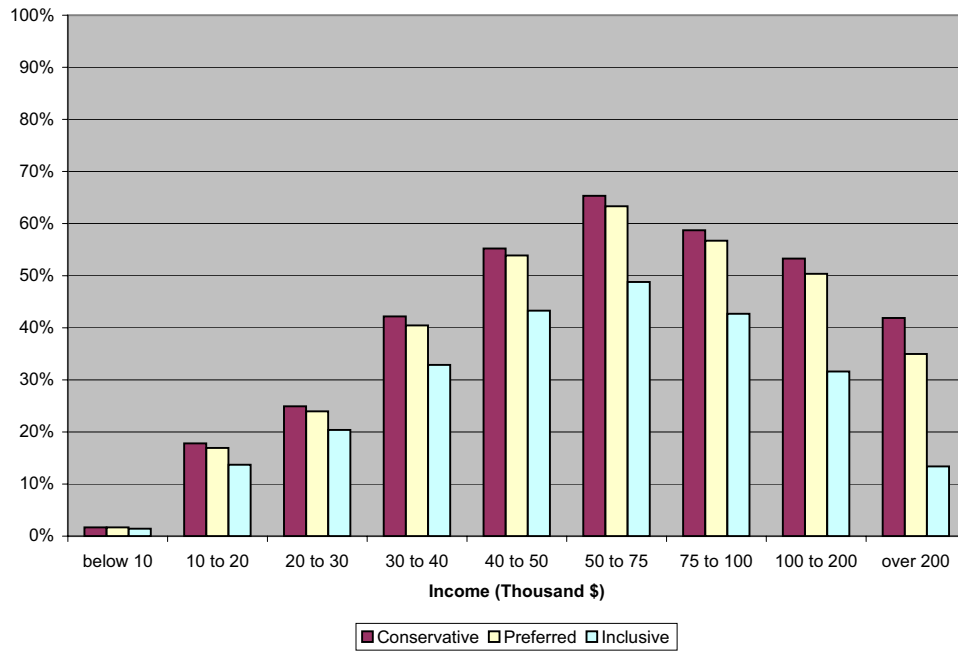


Figure 11: Mortgage Incidence by Wealth after Reshuffling

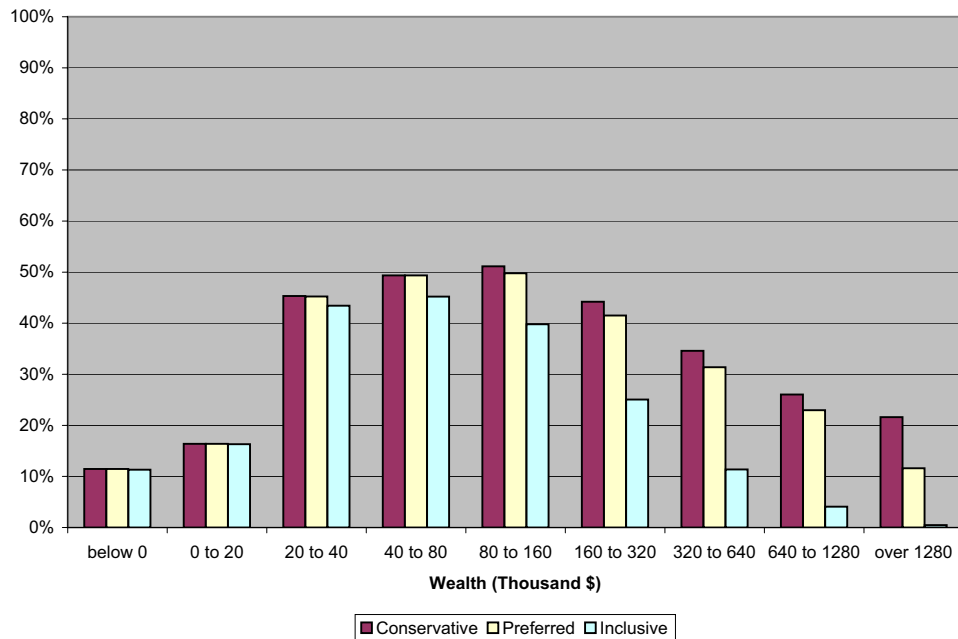




Table 6: Mean Non-Residential Assets for Home Owners with a Mortgage Relative to those Without

Age	Canada	US	Conservative	Preferred	Inclusive
25-29	2.38	2.91	0.64	0.64	0.47
30-34	1.46	1.73	0.73	0.70	0.58
35-39	1.25	2.71	1.22	1.17	0.87
40-44	0.82	3.95	0.66	0.64	0.49
45-49	0.83	1.82	0.56	0.53	0.41
50-54	0.69	2.03	0.66	0.61	0.52
55-59	0.81	1.37	0.51	0.47	0.42
60-64	0.80	1.18	0.32	0.30	0.26
65+	0.82	1.94	0.68	0.63	0.59

home owners tend to pay off their mortgage before accumulating non-residential assets. For each age group, the numbers in this Table represent the mean amount of non-residential assets held by home owners with a mortgage relative to the amount of non-residential assets held by home owners without a mortgage.<sup>22</sup> A value of one thus means that households with and without mortgage debt tend to hold the same amount of non-residential assets. A value above one, as is the case for all age groups in the U.S., means that households with a mortgage tend to own more non-residential assets than households who own their house outright. Finally, a value below one, as is the case for Canadian households above 40 years of age, means that households with 100 percent equity in their house tend to have more non-residential assets than households with a mortgage. The last three columns of Table 6 show that according to our measures, these ratios for the U.S. would become much closer to those of Canadians if mortgage interest deductibility were removed from the tax code.

<sup>22</sup>Non-residential asset holdings are defined as total assets minus (value of principal residence + value of vehicles + assets for retirement). The definition of non-residential assets is the same as the definition of interest bearing assets for the inclusive measure discussed in Section 3.

## 6 Conclusion

This paper argues that the conventional way of measuring the cost, in terms of government revenue losses, of allowing mortgage interest deductibility is highly overstated in the literature. The reason is simple: households would reshuffle their balance sheet if mortgage interest deductibility were abolished. Since the conventional measure assumes that individual behavior would not change after the elimination of tax expenditures, it greatly overstates the cost of this program.

We compute three alternative measures of the cost of mortgage interest deductibility. Each measure computes the amount of assets that households would use to buy out mortgage debt if MID were abolished. These measures differ as to the kind of assets households would use for that purpose. We find that the cost of MID is between 35 and 65% of the conventional measure.

We also characterize the distributional impact of MID. According to our preferred measure, the benefits of MID do not increase with wealth for wealth levels above the median. We also argue that while the benefits of MID increase with income, they do not increase as fast as taxes paid. Accordingly, we show that mortgage interest deductibility makes the tax code less progressive at relatively low levels of income and more progressive for relatively high levels of income. Finally, we show that mortgage interest deductibility is particularly important for new home buyers, a pattern that does not emerge with the conventional measure.

This type of analysis is of course subject to some caveats. Although the Survey of Consumer Finances offers high quality data on assets and liabilities, it contains virtually no information on their characteristics. In particular, we have no information about the return nor the risk of any of the components of households' portfolio. We tried to deal with this issue by considering different measures of assets that households would use to lower their outstanding mortgages following the elimination of mortgage interest deductibility, but we do not consider the possibility that households may use mortgage debt to diversify their portfolio (See Berkovec and Fullerton (1992)). A second caveat is that our analysis does not allow us to make any normative statements with respect to this program. To do so would require a model of dynamic individual behavior with an explicit tenure choice, which we leave for future research.

## A Description of SCF Data

The data for household wealth and income used in this paper is from the 1998 Survey of Consumer Finances (SCF). The SCF is a triennial survey of households sponsored by the Federal Reserve Board. The survey collects information on assets, liabilities, income, employment, demographics and relationship with financial institutions using a dual sampling procedure; a multi-stage area probability sample and a list sample derived from statistical records derived from tax returns. The data contains information for 4305 households with 2813 of these based on an area probability national sample while 1492 based on a list sample.<sup>23</sup>

In the SCF most of the variables that originally contained a missing value code are imputed. These imputations are stored as five successive replicates (“implicates”) of each data record. Thus, the number of observations in the full data set (21,525) is five times the actual number of respondents (4,305). We use the full data set with implicates for our computations. Since the SCF is not an equal-probability design, all statistics reported in this paper are calculated using the SCF final non-response-adjusted sampling weights to produce estimates that are representative of all households in the US in 1998. As suggested by the SCF 1998 code book, a weighted average of the implicates is used for the computations that follow with the weight associated with each implicate divided by 5.

Information on the state of residence of households is crucial for tax computations since income tax rates differ across states and state income taxes are deductible at the federal level. For confidentiality reasons, unfortunately, the state of residence is not available in the public data set. However, the 1998 SCF data set provides the census region of residence of the household. Census regions are based on a geographic division of the country into nine regions. Each census region consists of between 3 and 9 states, shown in Table 7. Using the census regions we overcome the lack of information about the state of residence by computing income taxes for a household in a region for each of the states in the region and then taking a population weighted average over the states to get the tax liability of the household.

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<sup>23</sup>The list sample is constructed using the IRS Survey of Incomes data set. See code book for SCF 1998 for details.

Table 7: Census Regions

Code	Region
1	Northeast: New England Division (CT ME MA NH RI VT)
2	Northeast: Middle Atlantic Division (NY NJ PA)
3	South: South Atlantic Division (DE DC FL GA MD NC SC VA WV)
4	South: East South Central Division (AL KY MS TN)
5	South: West South Central Division (AR LA OK TX)
6	Midwest: East North Central Division (IL IN MI OH WI)
7	Midwest: West North Central Division (IA KS MN MO NE ND SD)
8	West: Mountain Division (AZ CO ID MT NV UT WY NM)
9	West: Pacific Division (AK CA HI OR WA)

## B Definition and Measure of Wealth

The definition of wealth used in this paper corresponds to net worth, defined as the difference between assets and liabilities for a household. The wealth concept used is referred to as marketable wealth and is the same as that used by Kennickell et al. (2000) and Budría Rodríguez et al. (2002).<sup>24</sup>

### ASSETS:

#### *Financial Assets:*

1. Liquidity: checking accounts, savings accounts, money market mutual funds and call accounts with brokers
2. CDS and NMMF: certificates of deposit and non-money market mutual funds
3. Stocks and bonds
4. Retirement assets: IRAs, thrift-type accounts and future pensions
5. Other financial assets: cash value of whole life insurance, other managed assets (trusts, annuities and managed investment accounts) and loans, future proceeds, royalties, futures, non-public stock, deferred compensation, oil/gas/mineral invest., cash n.e.c.

<sup>24</sup>The code we use for wealth computation is available at <http://www.federalreserve.gov/pubs/oss/oss2/95/codebk95pt5.html>.

*Non Financial Assets:*

1. Vehicles: autos, motor homes, RVs, airplanes, boats
2. House(s): Primary and secondary residence
3. Other residential real estate
4. Business(net worth): value of net equity if business were sold today
5. Net equity in nonresidential real estate
6. Other (net) non-financial assets

**DEBT:**

1. Mortgage debt: mortgage, home equity loans and HELOCs on primary and secondary residence

*Other debt:*

1. Other lines of credit
2. Loans: credit card debt and installment loans
3. Other debt: loans for pensions, loans for life insurance, margin loans, miscellaneous

## C Tax Computation

TaxSim version 5.1 provided by the NBER is used to compute income taxes for each household in the SCF data set for the 1997 tax year. Income taxes are computed under the following assumptions: 1) filing unit is the household; 2) all cohabitating and married couples file jointly; and 3) itemization status is determined by TaxSim and not by a direct question in the SCF.<sup>25</sup> A household from a census region is given states codes for all states in the region. This provides between 3 and 9 different sets of data for each household depending on the region of residence. The data is then uploaded to TaxSim to compute the adjusted gross income (AGI), tax liability and marginal tax rate for each household in the data set and for each state of the region of residence. Doing so, we compute tax liabilities and marginal tax rates for all possible

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<sup>25</sup>The code to compute the information required by TaxSim from SCF data was provided by Kevin Moore from the Federal Reserve Board.

Table 8: Comparison of SCF with IRS along some dimensions (\$ thousands)

	IRS		SCF	
	Number	Amount	Number	Amount
All returns	122,421,991		102,548,842	
Salaries & wages	104,404,985	3,613,918,456	77,540,200	3,870,160,160
Taxable interest	67,300,571	171,700,242	30,893,520	101,103,151
Tax-exempt interest	4,925,914	49,016,921	3,529,790	37,613,409
Dividends	29,507,639	120,493,432	16,275,028	98,345,183
Business, Rent, etc. <sup>a</sup>		378,716,964		724,892,903
Net capital gain	24,240,112	356,083,267	10,502,082	259,872,092
Unemploy comp	7,124,100	17,230,102	4,588,889	13,762,613
Total item deduct	36,624,595	620,810,172	21,856,600	520,981,089
Mrtg int deduct <sup>b</sup>		235,000,000		249,250,000
AGI <sup>b</sup>		4,969,949,986		5,145,062,346
Federal Tax Total <sup>b</sup>		768,290,921		875,850,374

<sup>a</sup> Includes rent, partnership and farm income.

<sup>b</sup> From SCF computed using TaxSim.

states that the household may reside in. Then for each household the tax liability and the marginal tax rates are averaged over states in the region using population weights from census data.

Table 8 provides a comparison of SCF and Internal Revenue Service (IRS) reports from Survey of Incomes (SOI) for 1997 fiscal year along various dimensions. As is evident from the table, total wages and salaries are higher in the SCF than the IRS while interest and dividend incomes are lower. Although total itemized deductions are low in the SCF, total mortgage interest deductions are close to the IRS number.

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