

The Effect of Tax Reform on Owner and Renter Taxes

Patric H. Hendershott

Professor Emeritus: University of Aberdeen and The Ohio State University
phh3939@gmail.com

David C. Ling

McGurn Professor of Real Estate, Hough Graduate School of Business, University of Florida
ling@ufl.edu

Gary A. McGill

J. Roy Duggan Professor, Fisher School of Accounting, University of Florida
gary.mcgill@warrington.ufl.edu

December 23, 2018

Abstract:

The Tax Cuts and Jobs Act of 2017 roughly doubled the standard deduction, eliminated personal exemptions and limited many deductions. These include deductions for local property taxes and state and local income and sales taxes and the amount of mortgage interest that can be deducted on new purchases/refinancings. The higher standard deduction will substantially increase its use. The effects on households will vary by household type, number of personal exemptions, tenure, income and location of residence (level of house prices and state and local tax rates) and a number of other variables. We use data from the 2013 Annual Housing Survey (supplemented from other sources) to calculate how the change in a household's income tax burden varies with these variables. Given our microeconomic data, we feature the geographical impact of the tax reform and also consider the impact of other possible limits on deductions.

1. Introduction

The 2017 Tax Cut and Jobs Act (New Tax Law) lowers taxes for most households. While there is a modest across the board reduction in personal income tax rates,¹ the major cause is a near doubling of the standard deduction (SD). The standard deduction for married couples filing jointly rises from \$12,700 in 2017 to \$24,000 in 2018 and that for single taxpayers goes from \$6,500 to \$12,000. In addition, the burden of the alternative minimum tax (AMT) is greatly lessened to the benefit of households earning over \$200,000: the ATM exemption is raised by 30 percent and the phase out of the exemption won't start until \$400 thousand for singles and \$1 million for married couples.

There are, however, two general negatives. First, personal exemptions are eliminated, although the tax effect for households with dependents under age 17 is partially offset by the doubling of the child tax credit to \$2,000 and increasing the refundable portion that allows more lower-income families to benefit.² Second, while state and local income, sales, and local real property taxes continue to be deductible, the deduction is limited to a combined total of \$10,000 (\$5,000 if single or married filing separately).³ This will tend to raise taxes for those that continue to itemize (although it decreases the likelihood that households will itemize).⁴

A specific negative applies to households purchasing a new home or refinancing their existing mortgage. The interest on a new home mortgage that can be deducted is reduced from that on \$1 million of indebtedness to that on \$750,000. Taxpayers with an existing mortgage can continue to claim home mortgage interest deductions on up to \$1 million of indebtedness. The grandfathering of existing mortgages should slow refinancing activity and house sales, and thus reduce the mobility

¹ A comparison of statutory tax rates and income thresholds for married couples filing jointly under pre- and post TCJA can be found at the Tax Foundation website: <https://taxfoundation.org/final-tax-cuts-and-jobs-act-details-analysis/>. Going forward, bracket thresholds will be adjusted based on the Chained Consumer Price Index for All Urban Consumers (C-CPI-U), which is expected to grow more slowly than the previous inflation measure. The personal tax rate cuts are scheduled to expire in 2025.

² The benefit of personal exemptions was largely phased out under old law for higher income households, so the impact of the new law on them is limited.

³ A number of miscellaneous itemized deductions are eliminated: employee business expenses, tax preparation fees, and investment interest expenses. All of these had been deductible to the extent they exceeded two percent of adjusted gross income.

⁴ The Congressional Budget Office estimates that 90 percent of households will take the SD with the percentage of renting households taking the SD approaching 100 percent. In 2016 the percentage of all households taking the SD was only 50. See <https://www.cbo.gov/publication/53312>.

of high income households located in high cost housing markets. The effect would be similar to that in response to the passage of Proposition 13 in California.⁵

Much commentary has been made on the distributional impact of the tax reform on households. Obviously higher income households will receive greater dollar cuts than lower income households, given that higher income households paid most of income taxes under old law. The top one percent earning households paid 40 percent of taxes; the top five percent (those earning over roughly \$200,000) paid 60 percent. Higher income households will also receive the largest cut as a share of after-tax income for the same reason⁶ – they pay most of the income taxes. On the other hand, the percentage change in tax liability will be greater for lower income households owing to the increase in the SD. We also calculate the percentage change in the effective tax rate (ETR), the change in the ratio of taxes paid to household income (AGI).

Income tax payments vary with household AGI, structure (filing status and number of dependents), tenure choice (and indebtedness), and with state and local income, sales and property tax rates and house price levels in the jurisdiction in which households reside, as well as federal tax law. We calculate the impact of the New Tax Law on the change in household income tax liabilities, the percentage change, and the effective tax rate (ETR), taking into account the decision to take the SD or itemize. Our analysis captures the complex interaction among SDs, itemizable housing expenses, household mortgage debt and the AMT. We do not take into account the macro economic effects of the law change; in particular, tenure status and the adjusted gross income of households are kept constant. If the latter were to grow in response to the cut in the corporate tax rate, household taxes would rise, but after tax income would rise by more.

Our primary results can be summarized as follows. Owing to the near doubling of the SD, the percentage of owning households itemizing will fall from approximately 60 percent to less than a quarter. Only a small percentage of high income renters will itemize under the new law. Very few households will pay the AMT under the new law. Under old law over 60 percent of those with AGI over \$200,000 paid it. Households in the aggregate will receive a 17 percent tax cut (renters, 20 and owners, 14).

⁵ On June 6, 1978, California's voters passed Proposition 13. Under Proposition 13 tax reform, property tax value was rolled back and frozen at the 1976 assessed value level. Property tax increases on any given property were limited to no more than 2 percent per year as long as the property was not sold.

⁶ This point is emphasized by Sammartino, Stallworth and Weiner (2018).

Important differences emerge among subgroups of owners and renters. For both, households with more dependents under age 17 get larger percentage tax cuts owing to the doubling of the child tax credit. Owners living in high house price areas receive smaller tax cuts. For renters the percentage cuts are the same up for AGI between \$10,000 and \$75,000, but less for higher income households. Owners in states with income taxes generally get smaller tax cuts, both in absolute and percentage terms.

The New Tax Law lowers the tax benefits of owner-occupied housing by modestly reducing the marginal tax rates at which households benefit from the non-taxation of the return on equity. However, a more subtle but more important effect follows from its substantial increase in the standard deduction and limits placed on the deductibility of state and local income, sales, and local real property taxes (i.e., “SALT” expenditures). Because itemization required giving up the standard deduction, housing related deductions equal to the SD less non-housing itemizable expenses are wasted in that this amount does not reduce taxable income below what it would be if the household rented. Thus, the increases in the standard deduction and limits on the deductibility of SALT expenditures will have a combined effect comparable to the elimination of the mortgage interest deduction and SALT expenditures for many households. For households that continue to itemize under the New Tax Law, the tax saving related to the quantity-demanded decision are not affected beyond the small cuts in marginal tax rates. However, the average tax savings related to mortgage interest deductions and SALT expenditures are nevertheless reduced (unless non-housing deductions exceed the standard deduction). Households will of course respond to these tax changes in many ways and the macro impacts of the New Tax Law on asset prices and economic activity will be important.

In the next section we describe our underlying data set, the 2013 Annual Housing Survey (AHS) conducted by the U.S. Department of Commerce supplemented by non-housing expense estimates from IRS tax return data, state income and sales tax estimates from the NBER TAXSIM model and house values from the Federal Housing Authority.⁷ In sections 3 and 4, we describe how taxes were calculated under 2017 tax law and under the new law and how the latter will change tax liabilities. The change calculations are illustrated for a few sample households in Section 5.

⁷ We use the 2013 AHS dataset because certain key variables are not available in the public use dataset beginning in the 2015 release.

Sections 6-8 provide our results. In these we emphasize the distributional impact of the negative aspects of the new law – the elimination of personal exemptions and the limitations on the deductibility of state and local income and sales taxes and real property taxes and on home mortgage interest deductions. We also analyze the impact of even tighter limitations that have been proposed. Closing remarks summarize our results and describe future work.

2. Underlying 2013 Household Data

The AHS contains detailed microdata on households including geographic location, number, age, relationship, marital status of occupants, income type and level, tenure status, property tax payments and original and current home values. Detailed mortgage information is also collected, including the number, amount and type of mortgages and mortgage interest rates and payments as well as original and remaining terms.

The actual owning and renting households in our data sample, as well as the number of households they represent using AHS household weights, are indicated in Table 1. We begin with the relevant households in the 2013 AHS and then exclude 1) households without a SMSA (state) identification, 2) households with negative AGI, and 3) households not identified as either owners or renters in the AHS data. The first exclusion is because state taxes paid are not known and the households cannot be used in any geographical analysis.

These exclusions produce an adjusted sample size of 32,518 that represents over 46 million households (30 percent of total US households). Of this adjusted sample, 14,463 households are identified as renters, which is representative of over 19 million households. The remainder of our AHS sample, 18,054 households, are identified as owners; however, 3,652 of these are deleted because the owner did not provide an estimated house value. Our final owner sample therefore contains 14,402 households which represent almost 27 million households.

The raw data required to compute each household's federal income tax liability is largely present in the AHS data, but tax computations require a number of assumptions. These assumptions and the key features of our income tax calculations under old and new law are summarized below.

- *Filing status.* Households are classified as married filing a joint return, single or head of household (if single and certain dependents are present in the household).
- *Income.* The AHS contains data on wages and other income (or losses). Information is also provided on whether anyone in the household receives Social Security income. The

household's gross income includes the income of the household head and spouse, including any taxable portion of Social Security income.

- *Exemptions.* Taxpayers received a 2017 personal exemption of \$4,050 for themselves, spouse and any dependent children or other dependents. The number of allowable dependents is determined based on an application of the tax eligibility rules as applied to the reported family relationships, ages and income of all household members. The allowed personal exemption amount is phased out for certain higher-income households under old law based on income thresholds adjusted for inflation. The new law eliminated all personal exemptions.
- *Standard deduction.* All households are allowed a *SD* amount based on filing status. Households may deduct the larger of the SD or actual itemized deductions (from Form 1040, Schedule A). The *SD* for single (married) households in 2017 was \$6,500 (\$12,700). Under new law, the *SD* for single (married) households in 2018 is \$12,000 (\$24,000).
- *Household-related itemized deductions.* The AHS data contains information on property tax payments and enough detail on mortgage loans to estimate 2013 mortgage interest (including interest related to home equity loans).
- *Nonhousing itemized deductions.* The AHS data is supplemented with micro data from the IRS and the National Bureau of Economic Research (NBER's) TAXSIM model to compute household-level estimates of state and local income taxes, sales tax deductions, charitable contributions, and miscellaneous itemized deductions. To obtain a household's state income tax liability, we use the TAXSIM model to estimate the 2013 state income tax liability based on 22 variable inputs, including state location (Feenberg and Coutts, 1993). To estimate a household's sales tax deduction we use regression equations that estimate the standard amount allowed by the IRS tables based on income, family size, and state location.⁸ For charitable contributions and miscellaneous itemized deductions, we use the 2013 IRS Statistics of Income data on averages by income group to estimate an average household level charitable contribution and miscellaneous itemized deductions.
- *Tax calculations.* Each household's taxable income is determined following all rules regarding allowance of deductions, phase-outs, etc. Each household's tax liability is first calculated by applying the appropriate 2017 tax rate schedule (married filing jointly, single, or head of household) to taxable income. The Net Investment Income Tax (NIIT)⁹ is also calculated for each household, as is the potential alternative Minimum Tax (AMT), with the final tax

⁸ See the NBER TAXSIM site for more information on obtaining these sales tax estimates (<http://www.nber.org/~taxsim/sales-tax-irs-publication-600/>).

⁹ The American Taxpayer Relief Act of 2012 introduced a Net Investment Income surcharge under IRC Section 1411 of 3.8 percent that applies to married (non-married) households with modified adjusted gross income in excess of \$250,000 (\$200,000), effectively raising the maximum tax rate. The NIIT surtax of 3.8 percent is applied to the lesser of: (1) net investment income and (2) the excess of the taxpayer's modified gross income over \$250,000 (\$200,000) for joint (single) filers. "Real Estate professionals" who spend substantial time working (more than 750 hours per year) in activities related to real estate, broadly defined, may avoid the 3.8 percent surcharge. For details, see: <http://taxfoundation.org/article/federal-capital-gains-tax-rates-1998-2013>.

liability being the greater of the regular tax or AMT. These calculations are repeated for the new tax law.

- *Tax credits.* The net tax liability of a household is after allowance for any tax credits for which the household is eligible. Credits considered include the earned income credit, the credit for the elderly and the child credit.

Table 2 provides summary information for homeowners in nine income ranges. The values include the percent of weighted observations in each income class, the percent of households in high cost metropolitan areas, the percent of households in a state without an income tax, and the median AGI and age of the homeowner, their median house value, loan-to-value (LTV) ratio, mortgage interest expense, property taxes rate and value of several itemizable expenses. Because numerous variables in the AHS are self-reported by the household, we use median values to minimize the potential effect of data errors/outliers.

Each of the first six income groups contains 12 to 17 percent of the owner sample; the next two have 5.5 percent and the over \$400,000 class is only 1.5 percent. The median ages of the lowest two classes are 73 and 59 years, respectively, while the median for the higher income classes is near 50. The higher age for the first two classes reflects the number of retired households with modest annual incomes. Home values are relatively constant around \$140,000 for the first three income classes and then rise to \$730,000 for the highest income class. The median estimated house value for our owner households is \$200,000. High house price areas are locations in the top decile of house prices based on the 2013 mean price of owner-occupied housing in the household's core-business statistical area (CBSA), as determined from data collected by the Federal Housing Administration. The percent living in high cost locations is under ten percent for the lowest to AGI classes, jumps to 44 and then cycles up to 60 (\$75-100 thousand) and back down to 34 percent for the highest AGI class.

The percent of owner households in states with an income tax increases from under 80 percent for the lowest three classes to 86 percent for those with AGI \$150,000-\$400,000, but then declines to 81 percent for the highest class. The median LTV-AGI relationship is also hump backed. The median ratio is zero for older (73 years) low-income owners, rises to 60 percent for those with AGI of \$75,000-\$100,000 and then declines to 34 percent for the highest income class. The initial rise reflects the decline in median age. Median mortgage interest and property tax expenses rise

with AGI, as do itemizable non-housing (Schedule A) expenses and median sales taxes. Median state income taxes rise dramatically with income.

More detail on house prices and debt usage is presented in Table 3. The median ratio of house value to AGI and median LTVs ratios are listed for homeowners in states with an income tax and states without in both metropolitan areas with high house prices and the average for the remaining metropolitan areas (normal house prices). All house price/AGI ratios (Panel A) decline as AGI rises, especially at the low end of the income distribution where many older (retired) households have lower AGIs. And, as expected, the ratios are higher in high house price areas. Owner households in states with an income tax also have higher house value to income ratios among households with AGI less than \$150,000. However, the pattern for higher income households is less clear.

Median LTV ratios (Panel B) are zero in the lowest income (oldest age) category because over half of the class has no mortgage. The ratio rises through the \$75,000 to \$100,000 AGI class in normal house price areas and then declines, reflecting less relative housing consumption at higher income levels. For owners in high house price areas, the ratios are again lower for lower income (and older) owners, and then rise, although the data are quite volatile. In states with an income tax, the LTV is always lower in high house price areas than in areas with normal house prices. An AGI will support the same loan amount whether in a high or low price area so LTV will generally be lower in high price areas.

Table 4 provides data on the dollar amount of mortgage interest expense, property taxes, and state and local income and sales taxes. Median mortgage interest expense (Panel A) generally rises with income, although this increase tends to flatten out in areas with average house prices and no state income taxes. As expected, the increases in mortgage interest expense associated with rising incomes are more pronounced in markets with high house prices. Median property tax payments also rise with household income (Panel B of Table 4); however, the median owner household pays about \$3,000 in high price markets, but just \$1,500 to \$2,100 in other markets.

The median dollar magnitude of state and local tax payments increases with income. Of course, these local tax obligations are substantially more pronounced among households who live in states with income taxes. The magnitudes are not noticeably different in high and average house price areas.

Table 5 provides summary information for renters in our nine AGI ranges. Three-quarters of the renter sample report AGIs of less than \$50,000, and only two percent have income over \$150,000. In contrast, the percentages for owners in the low and high income classes are 44 and 13. This demonstrates the strong positive correlation between household income and home ownership. The median AGI in our owner sample is \$59,478 (Table 2), while the median AGI of our renter sample is just \$26,000.

The median age of renting household heads is 40 versus 54 for owners. Like owners, the median age among renters of the lowest income class is far higher (55) than the average, which again reflects the number of retired households with modest annual incomes. Twenty-five percent of renter households live in CBSAs with high house prices, versus 34 percent of owners. Seventy-nine percent of renters live in states with an income tax, close to the owner percentage.

3. Taxes Paid by Households under 2017 Law

To clarify the magnitude of homeowner income tax liabilities, before and after passage of the Tax Act, we define the following variables:

AGI = adjusted gross income as a renter;¹⁰

SALTD = allowable deduction for both State & Local (S&L) income and sales taxes;

PTD = allowable property tax deduction;

MID = allowable mortgage interest deduction

OID = other itemized (Schedule A) expenses;

SD = available standard deduction;

EXEMPT = total dollar amount of personal and dependency exemptions;

i(e) = before-tax rate of return available on nonhousing assets of equal risk to the housing investment;

i(d) = before-tax cost of mortgage debt financing;

δ = loan-to-market-value ratio (leverage rate);

P = nominal market value of the house.

¹⁰ Comparing home owners and renters with the same labor income and wealth, the AGI for owners will be less because part of their wealth is invested in their house, which is not included in measured AGI.

Prior to the tax reform, the federal tax liability of an owner ($TAXO^O$) was equal to¹¹:

$$TAXO^O = \begin{cases} t^O(AGI - EXEMPT - SD^O) & \text{if not itemizing} \\ t^O(AGI - EXEMPT - SALTD^O - PTD^O - MID^O - OID) & \text{if itemizing.} \end{cases} \quad (1)$$

If the sum of allowable deductions for S&L income and sales taxes, local property taxes, mortgage interest, and other itemized deductions exceeded the SD , owning households would choose to itemize (the bottom row in equation (1)); otherwise the household would elect to take the standard deduction (SD^O). Taxable income under either scenario was taxed at an average marginal rate of t^O .

Taxpayers were allowed to deduct the larger of S&L income or sales taxes. Thus, the allowable deduction could be less than total expenditures on these two items. Local property taxes were fully deductible. Taxpayers were also allowed to deduct interest paid on up to \$1 million of mortgage debt secured by a first or second home. Thus, $MID^O = i(d)[\text{MIN}(\delta P, \$1,000,000)]$. Itemized (Schedule A) deductions (with some exceptions¹²) were phased out for higher income households. In 2017, this gradual phase out began at AGI of \$313,800 for married couples filing jointly and \$261,500 for single households.¹³ The value of each personal exemption was reduced by 2 percent for each dollar of AGI above \$320,000 for married filers and \$266,700 for single households. The ability to benefit from personal exemptions was fully phased out at AGI of \$442,500 (\$389,200) for married (single) households. Equation (1) also holds for renters; however, PTD^O and MID^O would equal zero.

Taxpayers also had to compute their taxes under an alternate tax system labeled the Alternative Minimum Tax (AMT). Running parallel to the regular tax code, the AMT is a separate set of rules under which some taxpayers must calculate their tax liability a second time. The AMT had a large exemption amount, but allowed fewer tax preferences (deductions) than the regular tax. For joint filers with alternative minimum taxable income above \$160,900 this exemption was reduced by \$0.25 for every dollar by which AMT income exceeded \$160,900. Any AMT income above the allowable exemption was taxed at a rate of 26 percent. AMT income (net of the allowable exemption amount) above \$187,800 was taxed at a rate of 28 percent.

¹¹ An O trailer denotes owner and R renter. An O superscript denotes old law and N denotes new law.

¹² Medical expenses, investment interest, and gambling losses were not subject to the phase out.

¹³ The itemized deduction phase-out affected the mortgage interest deduction, charitable contributions, the state income tax deduction and the property tax deduction. These deductions were reduced by 3 percent of the difference between the household's AGI and its AGI threshold. However, the phase-out reduction could not exceed 80 percent of the household's total itemized deductions for the tax year.

The ATM was designed to capture more income tax from households that would otherwise claim large deductions and have less tax liability. When enacted in 1986, the AMT was intended to affect only a few households who were able to avoid paying the regular income tax. And in 1987, only 0.1 percent of households paid the AMT. Because the AMT was not indexed, it applied to more households over time. According to the Tax Foundation, more than 4.4 million households were subject to the AMT prior to the Tax Act, and nearly 60 percent of households making between \$200,000 and \$500,000 were subject to the AMT in 2015.¹⁴

A household's ETR is calculated as the maximum of the regular tax or the AMT, divided by AGI. Because allowable exemptions, credits, and deductions can reduce taxable income far below AGI, the effective rate of tax can be substantially less than the average rate of tax applied to taxable income.

4. Taxes to be Paid under the New Law

Some limits are placed on housing expenses. More specifically, the deduction for itemized local property taxes, plus the sum of the higher of S&L income and sales taxes, cannot exceed \$10,000. In addition, should a moving or refinancing household choose to itemize, they are allowed to deduct interest paid on up to only \$750,000 of total mortgage indebtedness, rather than the previous one million of indebtedness. Thus, $MID^N = i(d)[\text{MIN}(\delta P, \$750,000)]$. This tighter cap on mortgage indebtedness primarily affects higher income households living in relatively high house price areas. Interest on home equity loans is no longer deductible. This change will impact a broader range of owning households because many households currently make use of home equity loans. Moreover, the value of the MID for many households will interact in a complicated way with local property taxes and S&L income and sales taxes. More specifically, deductible property taxes, PTD^N , is equal to $\text{MIN}\{(PTE + SALTE), \$10,000\}$, where $SALTE$ is total $SALT$ expenditures. Said differently, total property tax expenditures (PTE) are fully deductible only if $(PTE - SALTE) \leq \$10,000$.¹⁵

Assuming itemization was optimal for owning households prior to the Tax Act, the following expression captures the extent to which the Tax Act increases the federal tax liability of an owner:

¹⁴ <https://taxfoundation.org/conference-report-alternative-minimum-tax/>

¹⁵ If S&L income and sales taxes are thought to be exogenous to housing decisions, then these taxes are first in line to absorb the \$10,000 limitation. If the sum of these taxes exceeds \$10,000, the household receives no tax benefit from its property tax expenditures.

$$TAXO^N - TAXO^O$$

$$= \begin{cases} (t^N - t^O)AGI + t^O[EXEMPT + SALTD^O + PTD^O + MID^O + OID] - t^N SD^N & \text{if not itemizing under new law} \\ (t^N - t^O)[AGI + (SALTD^O - SALTD^N) + (PTD^O - PTD^N) + (MID^O - MID^N) + OID] + t^O EXEMPT & \text{if itemizing under new law} \end{cases} \quad (2)$$

$TAXO^N$ and $TAXO^O$ are the federal tax liabilities under new and old law, respectively. For homeowners taking the standard deduction (SD^N) under new law [first row in equation (2)], their tax liability will be decreased to the extent that AGI is taxed at a lower rate; that is, $t^N < t^O$. An owner's tax liability under new law will be further reduced if the tax savings from the increased standard deduction ($t^N SD^N$) exceed the tax savings under earlier law from both their exemptions ($t^O EXEMPT$) and their allowable itemized deductions. Although equation (2) does not capture the effects of the AMT or any allowable tax credits on federal tax liabilities, all of our calculations using AHS data reported below include these effects, including the child care credit.

For owning households itemizing under new law [second row in equation (2)], changes in homeowner tax liabilities will largely be determined by the extent to which allowable S&L tax deductions, property tax deductions, and mortgage interest deductions are reduced. The decrease in these allowable deductions will be greater for higher income households located in areas with high house prices, S&L taxes rates, and property tax rates. The impact of these reduced deductions will be magnified to the extent they are deducted at a lower average rate, i.e., $t^N < t^O$. Taxes for owners will also increase under new law by an amount equal to the lost tax savings on personal exemptions ($t^O EXEMPT$). However, under old law the existence of the AMT and the phase-out of personal exemptions reduced or eliminated the tax savings associated with personal exemptions for many higher income households. Moreover, the doubling of the child tax credit to \$2,000 for each dependent under the age of 17 will partially or fully offset the loss of personal exemptions for some households and actually provide more tax savings than the exemptions for households with a number of dependents under 17.

The large increase in the standard deduction and the limitation of S&L tax deductibility makes it very likely that few renters will itemize under the Tax Act. The following expression captures the extent to which the Tax Act increases the federal tax liability of renters who do not itemize under new law:

$$TAXR^N - TAXR^O$$

$$= \begin{cases} (t^N - t^O)AGI + (t^O - t^N)(SD^O - SD^N) + t^O EXEMP & \text{if not itemizing under old law} \\ (t^N - t^O)AGI + [t^O(SALTD^O + OID) - t^N SD^N] + t^O EXEMPT & \text{if itemizing under old law} \end{cases} \quad (3)$$

For renters who took the standard deduction under the old law (first row in equation (3)), their tax liability under the new law will be decreased to the extent AGI is taxed at a lower rate (i.e., $t^N < t^O$). A renter's tax liability under new law will be further reduced to the extent SD^N exceeds SD^O ; however, this tax saving will be tempered by the reduced rate at which the standard deduction is deducted. Finally, the lost tax savings on personal exemptions ($t^O EXEMPT$) may offset the increased SD and the lowering of the marginal rate of taxation on income for many renting households with two or more dependents. However, as for owners, some renters will benefit under the new law to the extent the tax savings from child tax credits exceeds to lost tax saving on personal exemptions. For renter households that itemized under old law [second row in equation (3)], key determinants of the impact of the new law on their tax liability are whether the value of the new standard deduction ($t^N SD^N$) exceeds the lost tax savings on SALT expenditures and other itemized deductions under old law and whether the tax savings from child tax credits exceeds to lost tax saving on personal exemptions.

5. Sample Tax Calculations

To help clarify the operation of our analytical tax liability model, we consider a hypothetical married household with AGI of \$100,000 that is filing jointly. The household is assumed to have two dependent children under the age of 17. In the results displayed in columns (1) and (2) of Table 6, we assume this household lives in a state without an income tax. Other assumptions are roughly averages obtained from our 2013 data set. The household's home is assumed to be valued at three times AGI or \$300,000. The outstanding first mortgage balance is \$150,000, or 50 percent of current house value. The assumed pretax mortgage interest rate is four percent, which implies annual mortgage interest expense of \$6,000. Property tax expenditures equal one percent of house value, or \$3,000. The household filed a joint 2017 tax return with four personal exemptions (worth \$16,200 in deductions). Deductible sales taxes are assumed to equal one percent of AGI; other itemizable expenses, including charitable contributions, are equal to 3 percent of AGI, or \$3,000. The available 2017 SD for married couples filing jointly was \$12,700. As displayed in column (1) of Table 6, this household would elect to itemize under old law because total itemizable expenses (\$13,000) exceed the SD of \$12,700.

With reported taxable income of \$70,800, the household faced a 2017 tax liability of \$9,688, excluding any AMT. After calculating taxable income for AMT purposes, married households could exempt \$84,500 in AMT taxable income from taxation. Our hypothetical household would therefore

not have been subject to the AMT, nor would it be subject to the net investment income tax (NIIT). Finally, old tax law provided a tax credit of \$1,000 for each dependent child under 17 years of age. The credit was reduced by \$50 for every dollar by which AGI exceeded \$110,000.¹⁶ Our hypothetical household with two dependents was therefore able to reduce its federal tax liability by the full \$2,000, resulting in a tax liability of \$7,688.¹⁷ This household's ETR (taxes/AGI) was 7.7 percent under old law.

Under new law, this household would lose its \$16,200 deduction for personal exemptions (column 2 of Table 6). However, its SD is increased to \$24,000; therefore the household would not itemize.¹⁸ This results in taxable income of \$76,000, which is \$5,200 higher than under old law. The AMT exemption for joint filers is increased under new law to \$109,400 and the level of AMT taxable income at which the exemption begins to be phased out is increased to \$1 million.¹⁹ The household would therefore not be subject to the AMT. However, the household is eligible for a \$4,000 tax credit (2 x \$2,000) under new law. After this credit, the household would pay \$4,739 in federal income tax, which is \$2,949 (38 percent) lower than under old law. This household's ETR is reduced from 7.7 percent to 5.2 percent. Note that the percentage reduction in ETR is 34, very close to the percentage reduction in taxes paid.²⁰

In the results reported in columns (3) and (4) of Table 6, we increase S&L income taxes from zero to three percent of AGI, or \$3,000, and the assumed ratio of house price to AGI from 3.0 to 5.0.

¹⁶ The threshold for single taxpayers was \$55,000 under old law.

¹⁷ Under both old and new law, some high income taxpayers are required to pay an additional Medicare tax of 0.9 percent on the amount of wage and self-employment income that exceeds the threshold amount. The thresholds for single and married couples filing jointly are \$200,000 and \$250,000, respectively.

¹⁸ Note that because the household does not itemize, the average rate at which mortgage interest and property tax expenditures are deducted is zero.

¹⁹ Under new law, the exemption for single taxpayers and other filers increased from \$54,300 to \$70,300. The threshold of AMT income at which the exemption is phased out \$0.25 for every dollar above the threshold has been increased from \$109,400 to \$1 million for married filing joint households. Both the exemptions and the level at which the phase-out begins are indexed to inflation.

²⁰ A potential Section 199A deduction, also known as the Qualified Business Income (QBI) deduction from AGI, was created by the Tax Act. For certain taxpayers, the deduction can be as much as 20 percent of QBI. Income distributed to taxpayers from most pass-through entities, such as sole proprietorships, limited partnerships, limited liability companies, S corporations, and REITs, will potentially qualify for the 20 percent reduction. However, income received by a taxpayer from a pass-through entity that provides "traditional" services, such as those provided by doctors, attorneys, real estate brokers, accountants, actuaries and consultants, may not qualify for the deduction if the taxpayer's taxable income exceeds certain thresholds. The deduction may also be limited by the wages the entity paid to workers and/or the original cost basis of property owned by the entity. No entity or taxpayer is made worse off by Section 199A; however, modeling its effects is complex. We therefore ignore its potential effect in all our calculations with the recognition that we are overstating the tax liability faced by some households under the TCJA and therefore are underestimating the percentage tax reduction for these taxpayers.

Under this higher state income tax and house price scenario, the household owns a home valued at \$500,000 with an existing 50 percent mortgage of \$250,000, annual mortgage expense of \$10,000, and a property tax liability of \$5,000. The household would elect to itemize under old law because total itemizable expenses (\$21,000) exceed the available *SD* of \$12,700. The household's taxable income of \$62,800 would produce a regular tax liability of \$8,488 and the household would not pay the AMT or a NIIT. After a \$2,000 child tax credit, the household's tax liability would be \$6,488, which is an ETR of 6.5 percent.

Under new law, the household would claim the standard deduction of \$24,000 because it exceeds the \$22,000 in allowable property tax, state and local income and sales taxes, mortgage interest, and other itemizable deductions. The household would not pay the AMT or the NIIT under either law. After claiming a \$4,000 child tax credit for its two dependents, the household would pay \$4,739 in federal income tax, a reduction from prior law of 27 percent. The household's ETR would decline from 6.5 percent to 4.7 percent, a 23 percent decline.

Finally, in the results reported in columns (5) and (6), we increase the assumed property tax rate to two percent of house value and the assumed ratio of S&L income taxes to AGI to 3.5 percent. Under this scenario, the household's allowable itemized deductions under old law are \$26,500, which reduces regular taxable income to \$57,300. However, the sum of property taxes and the higher of S&L income and sales taxes now equals \$14,500, which exceeds the allowable maximum of \$10,000 under new law. On net, this household would experience a \$924 (16 percent) reduction in its federal income tax liability under the new law and would face an ETR of 4.7 percent (decline of 18 percent).

Although not separately tabulated, we performed comparable calculations for renting households with \$100,000 in AGI under each of the scenarios discussed above. In all three, renting households will experience a decline in federal tax liabilities of 35 percent, equal to the decline for owning households under the first scenario, and a decline in effective tax rates of 2.8 percentage points. The decline in tax liabilities for renters is unchanged across the three scenarios because these moderate income households would claim the standard deduction under both old and new law.

6. Estimates of Tax Liability Changes for Households Using AHS Data

While the impact of the new tax law on taxes a household pays depends on its size, labor and investment income (AGI), where it is located (house price level, property tax rate, and state and local taxation), and whether it owns or rents, we begin with a simple aggregate calculation where AGI

and tenure are the only variables that vary. Table 7 indicates the changes in tax burdens for owning and renting households by income class. Three measures are given of the impact of new law on owner tax liabilities: (1) the median dollar change in tax liability; (2) the median percentage change in tax liability, and (3) the median change in the ETR. The percentage tax cuts for both owners and renters are miniscule for the lowest income class because people in this class were largely not paying taxes under old law and thus cannot receive a cut. For owners with AGI of \$10-\$100 thousand, the cut is about 16 percent. For those with higher AGI, the cut is a smaller 12 percent. For renters with AGI of \$10-\$150 thousand, the cut is nearly 20 percent, but only 6 to 15 percent for higher income renters.

These aggregate numbers are greatly affected by how the tax law change is expected to affect the itemization choice and the relevance of the AMT. Columns (1)-(3) of Table 8 indicate the percent of owners/renters that should have itemized under old law and will under new law, as well as the percentage change in those itemizing. First, itemization increases with income because deductible expenses rise with income. Under old law only 11 percent of owners (Panel A) in the lowest income class should have itemized, with this percentage rising to 100 percent for those with AGI > \$400,000. Second, renters (Panel B), with no mortgage interest or property tax deductions, are less likely to itemize (only 12 percent of entire sample versus 59 percent for owners). The near doubling of the SD under the new law sharply decreases the likelihood of itemization. The total percentage drops by 60 percent for owners and 90 percent for renters. In fact, no renter in our AHS sample with AGI < \$100,000 is expected to itemize.

Column (4) indicates the percentages likely to be paying the ATM under old law. For both owners and renters, virtually no one with AGI < \$150,000 should have paid the AMT and roughly 60 percent of those with AGI > \$200,000 should have. Under new law virtually no household on our AHS sample should pay the AMT (the maximum household AGI in our sample is \$2,500,000), although some high income households will still be negatively affected by the AMT.²¹

Tables 9-11 indicate how the location of the household will affect their percentage tax cut (levels of house price and property tax rate and the existence of a state income tax). The first two

²¹ The AHS data caps reported income and thus does not capture ultra-high income earners who would still likely be subject to the AMT. According to the Tax Policy Center (<https://www.taxpolicycenter.org/model-estimates/baseline-alternative-minimum-tax-amt-tables-oct-2018/t18-0145-aggregate-amt>), among households making \$1 million or more, only about 11.5 percent will pay the AMT, about half as many as in 2017. For more details, see Gleckman (2018).

are relevant to owners only. The third is applicable to both owners and renters, but we report results for owners only.

Panel A of Table 9 provides these results for owner households living in high house price MSAs; Panel B contains the corresponding results for the remaining owners. The median percentage tax cut for all households in high-priced MSAs is 9 percent and ranges from 8 to 13 percent (excluding the lowest income category that has a minimal cut, given that they were not paying taxes under old law). Although the dollar magnitude of the tax cut increases with income, there is no systematic relationship between the percentage cut and AGI. The median percentage for the remaining owners is two-thirds higher (15 percent) and ranges from 11 percent to 19 percent (again, excluding the lowest income category). Here the percentage cut is significantly greater for owners with AGI < \$100,000 (17 percent) than for higher income households (13 percent). Clearly, the limitation on the deductibility of state and local taxes partially offsets the favorable provisions of the new law for many higher income owners. As always, the median decrease in the ETR for owner households rises with income in both panels, the decrease being slightly less in high-priced housing markets.

In Table 10, we disaggregate owner households into two property tax categories: those residing in markets where the average property tax rate is greater than the sample median and those living in areas where the average tax rate is below the median. The median tax cut in dollars for owners in relatively low property tax areas is \$603 versus \$496 in the relatively high tax areas. For owners in low tax areas with AGI less than \$100,000 the percentage tax cut is roughly 18 percent, while for higher income owners it is only 13 percent. For owners in high tax areas the differences are less consistent. A general result regarding property taxes is that higher rates are usually associated with small dollar and percentage tax cuts, as well as smaller ETR reductions. The exception to this general trend is households with AGI greater than \$200,000. For these households, all three measures of tax liability reductions are slightly higher among households that reside in areas with relatively high property tax rates.

Table 11 contrasts results for owner households living in states with an income tax (Panel A) with those for households located in states without such a tax (Panel B). The median dollar change in tax liability increases with AGI in all states. The pattern of percentage tax cuts is consistent across both categories, but the percentage is greater for those in states without a state tax (-17) than those with a state tax (13). The pattern is that lower income households (AGI < \$100,000) receive

larger percentage cuts. This is, of course consistent with the overall results in Table 7. The median decrease in the ETR for owner households is just over one percent. Of course, higher income households experience the largest reduction in ETRs because they receive larger dollar tax cuts.

Table 12 indicates how the number of dependents under age 17 affects the amount of tax relief. Recall that the median tax cut among owner households is \$558 (Table 7). However, the median cut for these households with no dependents under the age of 17 is only \$242 (Panel A of Table 12). The corresponding tax reduction for households with one dependent, two dependents, and more than two dependents under the age of 17 are \$1,356, \$1,793, and \$2,253, respectively. And the percentage reduction rises from 10 to 32. That is, the greater the number of dependents, the greater the tax cut. The \$1,000 increase in the child tax credit under new law, along with modest statutory rate reductions, more than offsets the loss of personal exemption deductions for virtually all households. Because the phase-out of the new child tax credit does not begin until AGI reaches \$400,000, households with AGI less than \$400,000 are able to benefit fully from the increased tax credit. Because higher income households are not eligible for the child tax credit, their tax liability is independent of the number of exemptions.

7. Additional Sensitivity Analysis (to be added)

We will compute the impact of lower limitations on state and local tax deductions and on home mortgage interest deduction. We will consider specific geographic areas with and without state taxes and with high and low house prices.

8. Conclusions and Further Work

We have the following general results. Owing to the near doubling of the SD, the percentage of households itemizing will be less than a quarter for those with AGI less than \$20,000, rising to over 95 percent for those with AGI over \$150,000 (virtually all with AGI over \$250,000). Very few (none) will pay the AMT under the new law. Under old law over 60 percent of those with AGI over \$200,000 paid it. The percentage of households paying no Federal income tax would rise from x percent to y percent (these data will be in our April presentation). Households in the aggregate will receive a 17 percentage tax cut (renters, 20 and owners, 14). Given that higher income households pay most of the taxes, they will get the largest tax cuts.

Regarding the distribution of tax cuts, the key results are as follows: The percentage tax cut is, of course, zero for households who would not pay taxes under old law. For owners the cut is about

16 percent for those with AGI less than \$100,000 and a lower 12 for those with higher AGI. For renters, the cuts are nearly 20 percent for those with AGI under \$150,000 and less for those with higher AGI. Higher income households will experience the greater declines in their ETRs, although not the greater percentage decline.

Subgroups of owners and renters are treated differentially. For both, households with more dependents under age 17 get larger percentage tax cuts owing to the doubling of the child tax credit. For owners the percentage tax cut rises from 10 with zero dependents to 32 with three or more. Owners living in high house price areas receive smaller tax cuts, roughly 5 percent less for those with AGI under \$150,000, but only one percent less for those with AGI over \$400,000. For renters the percentage cuts are the same up for AGI between \$10,000 and \$75,000, but less for higher income households. Owners in states with income taxes generally get smaller tax cuts, both in absolute and percentage terms.

Households will respond to these tax changes in many ways. Most obviously, the reduced value of housing deductions will make owning less attract relative to renters. And leverage will be reduced owing to limits on mortgage interest deductions. More macro impacts on asset prices and economic activity will be important. These are all topics for future research.

References

Feenberg Daniel and Elisabeth Coutts, “An Introduction to the TAXSIM Model,” *Journal of Policy Analysis and Management* (12)1; pages 189-194.

Gleckman, Howard, “The Tax Cut and Jobs Act and the Zombie AMT,” *Forbes*, October 2, 2018.

Sammartino, Frank, Phillip Stallworth and David Weiner, “The Effect of The TCJA Individual Income Tax Provisions Across Income Groups and Across States,” Tax Policy Center, Urban Institute and Brookings Institution, March 28, 2018.

Tax Foundation, “Preliminary Details and Analysis of the Tax Cut and Jobs Act,” December 18, 2017

Table 1: Sample construction using AHS data

	Number of Observations	
	Raw Obs.	Weighted Obs. ^a
Total housing units in the U.S. from AHS data	84,355	132,866,433
Minus obs. with no state info	-38,314	-67,999,400
Minus obs. with negative AGI	-1,080	-1,645,081
Minus vacancy and seasonal units	-12,443	-16,834,558
Adjusted sample	32,518	46,387,394
Minus number of renters	-14,464	-19,471,751
Equals number of owners	18,054	26,915,643
Minus owner obs. with no house value	-3,652	-232,527
Final owner sample	14,402	26,683,116

^a According to the U.S. Census Bureau, every housing unit in the AHS represents itself and about 1,896 other units.

Source: American Housing Survey (AHS) data and authors' calculations.

			Median	Median	Percent	Percent	Median	Median	Median	Median	Median	Median	Median
AGI	Percent of	Median	age of	home	high cost	in state w.	leverage	mortgage	property	non-housing	itemizable	sales	state
(000s) ^a	sample	AGI	HH head	value ^b	location ^c	inc. tax ^d	ratio ^e	interest ^f	tax	expenses ^g	expenses ^h	tax	inc. tax
0-10	16	200	73	150,000	0	77	0.00	0	1,450	149	3,151	17	0
10-30	14	20,787	59	130,000	9	79	0.09	619	1,450	3,967	7,251	349	0
30-50	15	39,987	53	140,000	44	77	0.44	2,725	1,750	5,520	10,713	540	507
50-75	17	62,002	51	180,000	54	81	0.54	3,970	2,050	6,138	12,724	701	1,559
75-100	12	86,987	50	210,000	60	83	0.60	5,029	2,550	7,519	15,304	862	2,656
100-150	14	119,987	49	270,000	57	85	0.57	5,838	3,050	9,306	18,850	1,029	4,420
150-200	6	169,974	49	350,000	51	86	0.51	7,093	3,950	14,122	25,630	1,289	7,221
200-400	6	314,209	51	500,000	44	86	0.44	7,696	5,050	23,433	38,986	1,704	13,490
> 400	1	441,930	51	730,000	34	81	0.34	10,532	6,750	42,222	63,347	2,485	25,194
All	100.00	59,487	54	200,000	37	81	0.37	3,005	2,150	5,921	12,466	624	842

Source: Authors' tabulations and estimates from the American Housing Survey, 2013 National File supplemented with non-housing expense estimates from the Internal Revenue Service tax return data and household level state income tax estimates from the NBER TAXSIM model. Number of households is based on the AHS survey sample of 14,402 owning households with SMSA (state) identification, projected back to the population of 26,683,116 based on household weights.

^a AGI is Adjusted Gross Income in thousands.

^b Estimated current fair market value of home (including land).

^c High housing cost areas are locations in the top decile of housing cost areas based on the 2013 mean price of owner-occupied housing in the core-business statistical area (CBSA) as determined from data collected by the Federal Housing Administration.

^d States without a comprehensive personal income tax are Alaska, Florida, New Hampshire, Nevada, South Dakota, Tennessee, Texas, Washington, and Wyoming.

^e Leverage ratio is the household's total outstanding mortgage debt divided by the estimated home value.

^f Total annual mortgage interest including first and second mortgages and home equity lines of credit.

^g Estimated non-housing itemizable expenses available for deduction on Schedule A, Form 1040.

^h Total of mortgage interest, property taxes, and non-housing expenses available for deduction before any caps on mortgage interest or state and local property taxes.

Table 3: Median house value-to-AGI and leverage ratios dissaggregated by house prices and state income tax

AGI (000s)	Panel A: Median house value-to-AGI ratio				Panel B: Median leverage ratio			
	No state tax	w. state tax	No state tax	w. state tax	No state tax	w. state tax	No state tax	w. state tax
	Ave. HPs	Ave. HPs	High HPs	High HPs	Ave. HPs	Ave. HPs	High HPs	High HPs
0-10	23.2	33.5	42.0	79.7	-	-	-	-
10-30	4.8	6.1	19.6	16.8	0.29	0.07	-	0.06
30-50	2.7	3.4	6.4	8.2	0.42	0.47	0.62	0.32
50-75	2.1	2.7	3.4	5.6	0.55	0.57	0.69	0.39
75-100	1.8	2.3	4.0	4.2	0.55	0.63	0.44	0.48
100-150	1.5	2.0	3.0	3.6	0.56	0.59	0.54	0.54
150-200	1.6	1.9	3.3	3.2	0.46	0.53	0.27	0.49
200-400	1.1	1.5	2.9	2.4	0.59	0.45	0.42	0.42
> 400	1.5	1.2	1.6	2.0	0.19	0.44	0.24	0.34
All	2.5	2.9	3.9	5.1	0.32	0.39	0.41	0.32

Source: American Housing Survey (AHS) data and authors' calculations. AGI is household-level adjusted gross income. The leverage ratio is defined as the total book value of outstanding mortgage debt divided by the estimated value of the home.

Table 4: Median mortgage interest, property tax, & state-local taxes

Table 4: Median mortgage interest, property tax, & state-local taxes								
	Panel A: Median mortgage interest				Panel B: Median property taxes			
AGI (000s)	No state tax Ave. HPs	w. state tax Ave. HPs	No state tax High HPs	w. state tax High HPs	No state tax Ave. HPs	w. state tax Ave. HPs	No state tax High HPs	w. state tax High HPs
0-10	0	0	0	0	950	1,550	2,050	2,150
10-30	1,250	272	0	1,145	1,250	1,450	2,750	2,050
30-50	2,343	2,778	4,607	3,839	1,450	1,750	2,350	2,550
50-75	3,264	3,870	6,669	5,511	1,750	2,050	2,550	2,550
75-100	3,900	4,923	8,897	7,931	2,150	2,450	3,550	3,050
100-150	3,847	5,590	8,330	8,488	2,750	3,050	3,250	3,850
150-200	5,040	7,043	7,479	9,546	3,050	3,650	4,550	5,050
200-400	5,857	7,273	14,286	9,423	4,750	5,050	6,050	5,650
> 400	5,511	10,158	22,751	14,081	7,050	6,050	7,550	8,950
All	1,887	2,994	5,567	5,137	1,550	2,150	3,150	3,050
Panel C: Median state and local taxes								
AGI (000s)	No state tax Ave. HPs	w. state tax Ave. HPs	No state tax High HPs	w. state tax High HPs				
0-10	3	17	137	22				
10-30	416	393	378	407				
30-50	604	921	588	667				
50-75	799	1,839	790	1,409				
75-100	978	2,925	1,039	2,810				
100-150	1,194	4,654	1,177	5,111				
150-200	1,453	7,475	1,544	8,234				
200-400	2,001	14,617	2,113	16,743				
> 400	2,638	28,380	2,975	31,997				
All	663	1,635	945	1,652				

Source: American Housing Survey (AHS) data and authors' calculations.

			Median	Percent	Percent	Median	Median	Median
AGI	Percent of	Median	age of	high cost	in state w.	itemizable	sales	state
(000s)	sample	AGI	HH head	location	inc. tax	expense	tax	inc. tax
0-10	23	2,000	55	22	82	1,315	82	0
10-30	33	19,987	39	23	76	3,827	354	0
30-50	20	39,987	37	23	79	5,677	531	949
50-75	12	60,987	37	29	78	6,446	707	1,866
75-100	6	85,987	39	35	84	8,224	860	3,455
100-150	4	119,987	39	36	82	10,264	1,050	5,501
150-200	1	166,160	38	36	86	15,584	1,412	8,894
200-400	1	314,235	41	39	86	25,958	1,753	16,028
> 400	0	439,943	36	48	91	46,715	2,036	31,990
All	100	26,000	40	25	79	4,964	400	44

Source: American Housing Survey (AHS) data and authors' calculations.

Table 6: Impact of TCJA on tax liability of owning households--\$100,000 in adjusted gross income

	No state income tax; average property taxes and house prices		Average state income taxes & property taxes; high house prices		High state income taxes, property taxes and house prices	
	Pre change	Post change	Pre change	Post change	Pre change	Post change
	Adjusted gross income	100,000	100,000	100,000	100,000	100,000
Exemptions	16,200	0	16,200	0	16,200	0
Exemption allowed after phaseout	16,200	0	16,200	0	16,200	0
Itemized deductions (ID)						
Property taxes	3,000	3,000	5,000	5,000	10,000	10,000
State & local income taxes	0	0	3,000	3,000	3,500	3,500
State & local sales taxes	1,000	1,000	1,000	1,000	1,000	1,000
Allowable state & local taxes	1,000	1,000	3,000	4,000	3,500	4,500
Allowable prop. tax & SALT	4,000	4,000	8,000	9,000	13,500	10,000
Other itemized deductions	3,000	3,000	3,000	3,000	3,000	3,000
Mortgage interest	6,000	6,000	10,000	10,000	10,000	10,000
Total itemizable deductions	13,000	13,000	21,000	22,000	26,500	23,000
Greater of ID or SD	13,000	24,000	21,000	24,000	26,500	24,000
Taxable income	70,800	76,000	62,800	76,000	57,300	76,000
Regular income tax	9,688	8,739	8,488	8,739	7,663	8,739
Alternative minimum tax	0	0	0	0	0	0
Federal income tax	9,688	8,739	8,488	8,739	7,663	8,739
Tax credit for children	2,000	4,000	2,000	4,000	2,000	4,000
Net tax after credits	7,688	4,739	6,488	4,739	5,663	4,739
Effective tax rate	7.7%	4.7%	6.5%	4.7%	5.7%	4.7%
Change in tax liability		2,949		1,749		924
Percentage change in tax liability		-38.4%		-27.0%		-16.3%
Change in effective tax rate (% pts.)		-2.90		-1.70		-0.90

Table 7: Changes in tax burdens by income

AGI (000s)	Owning households			Renter households		
	\$ change in tax liability	% change in tax liability	change in effective tax rate	\$ change in tax liability	% change in tax liability	change in effective tax rate
0-10	0	0.00	0.000	0	-2	0.000
10-30	-55	-0.16	-0.002	-180	-20	-0.012
30-50	-330	-0.15	-0.009	-804	-20	-0.020
50-75	-848	-0.18	-0.014	-1,469	-20	-0.025
75-100	-1,371	-0.17	-0.016	-1,907	-17	-0.023
100-150	-1,829	-0.12	-0.015	-2,953	-19	-0.027
150-200	-2,697	-0.11	-0.016	-4,682	-15	-0.029
200-400	-6,121	-0.13	-0.025	-4,269	-6	-0.012
> 400	-15,831	-0.14	-0.035	-14,489	-13	-0.036
All	-558	-0.14	-0.011	-384	-20	-0.015

Source: American Housing Survey (AHS) data and authors' calculations.

Table 8: Changes in percentage of households itemizing & paying the AMT

Panel A: Owning households				
AGI (000s)	% of HHs itemizing 2017	% of HHs itemizing 2018	Change in % of HHs itemizing	% of HHs paying AMT 2017
0-10	11	3	-9	0
10-30	33	6	-27	0
30-50	59	17	-41	0
50-75	64	22	-42	0
75-100	75	25	-50	1
100-150	86	33	-53	0
150-200	97	51	-47	6
200-400	99	71	-28	61
> 400	100	94	-6	66
All	59	23	-36	5
Panel B: Renting households				
AGI (000s)	% of HHs itemizing 2017	% of HHs itemizing 2018	Change in % of HHs itemizing	% of HHs paying AMT 2017
0-10	0	0	0	0
10-30	0	0	0	0
30-50	13	0	-13	0
50-75	30	0	-30	0
75-100	39	0	-39	0
100-150	41	14	-27	0
150-200	85	21	-64	9
200-400	94	49	-45	60
> 400	100	100	0	56
All	12	1	-11	1

Source: American Housing Survey (AHS) data and authors' calculations.

	Panel A: High house price MSAs			Panel B: Non High price MSAs		
AGI (000s)	\$ change in tax liability	% change in tax liability	change in effective tax rate	\$ change in tax liability	% change in tax liability	change in effective tax rate
0-10	0	-2	0.000	0	0	0.000
10-30	0	-13	0.000	-61	-16	-0.003
30-50	-115	-8	-0.003	-330	-17	-0.009
50-75	-512	-14	-0.008	-880	-19	-0.015
75-100	-1011	-11	-0.011	-1,459	-18	-0.017
100-150	-1269	-8	-0.011	-1,996	-14	-0.016
150-200	-2213	-9	-0.012	-2,939	-11	-0.018
200-400	-5282	-10	-0.021	-6,815	-14	-0.026
> 400	-15143	-13	-0.033	-16,098	-14	-0.036
All	-469	-9	-0.009	-573	-15	-0.012

Source: American Housing Survey (AHS) data and authors' calculations.

	Panel A: Property tax rate ≤ to median			Panel B: Property tax rate > median		
AGI (000s)	\$ change in tax liability	% change in tax liability	change in effective tax rate	\$ change in tax liability	% change in tax liability	change in effective tax rate
0-10	0	0	0.000	0	0	0.000
10-30	-74	-20	-0.004	-27	-12	-0.001
30-50	-330	-18	-0.010	-320	-12	-0.008
50-75	-870	-18	-0.015	-798	-16	-0.013
75-100	-1,449	-17	-0.017	-1,282	-16	-0.015
100-150	-1,874	-13	-0.015	-1,746	-12	-0.014
150-200	-2,920	-12	-0.017	-2,466	-9	-0.013
200-400	-6,008	-13	-0.024	-6,653	-15	-0.026
> 400	-15,468	-14	-0.035	-15,973	-14	-0.035
All	-603	-15	-0.012	-496	-13	-0.010

Source: American Housing Survey (AHS) data and authors' calculations.

Table 11: Changes in owner tax liabilities disaggregated by state income tax

AGI (000s)	Panel A: States with income tax			Panel B: States without income tax		
	\$ change in tax liability	% change in tax liability	change in effective tax rate	\$ change in tax liability	% change in tax liability	change in effective tax rate
0-10	0	0	0.000	0	-1	0.000
10-30	-55	-16	-0.002	-55	-13	-0.003
30-50	-325	-14	-0.009	-429	-19	-0.011
50-75	-800	-17	-0.014	-965	-20	-0.016
75-100	-1,292	-16	-0.015	-1,609	-20	-0.020
100-150	-1,677	-11	-0.014	-2,565	-15	-0.021
150-200	-2,551	-10	-0.015	-4,322	-14	-0.024
200-400	-5,771	-13	-0.023	-7,396	-16	-0.032
> 400	-15,210	-14	-0.035	-18,696	-14	-0.039
All	-565	-13	-0.011	-520	-17	-0.013

Source: American Housing Survey (AHS) data and authors' calculations.

Table 12: Changes in owner tax liabilities dissagregated by number of dependents

	Panel A: No dependents unders age 17			Panel B: One dependents under age 17		
AGI (000s)	\$ change in tax liability	% change in tax liability	change in effective tax rate	\$ change in tax liability	% change in tax liability	change in effective tax rate
0-10	0	0	0.000	0	-3	0.000
10-30	-16	-20	-0.001	-512	-11	-0.024
30-50	-272	-10	-0.006	-973	-68	-0.023
50-75	-618	-11	-0.010	-1,211	-35	-0.020
75-100	-1,120	-11	-0.012	-1,693	-24	-0.019
100-150	-1,643	-9	-0.014	-1,970	-14	-0.017
150-200	-2,129	-8	-0.012	-2,697	-11	-0.016
200-400	-4,350	-9	-0.017	-6,647	-13	-0.024
> 400	-15,126	-14	-0.034	-16,156	-15	-0.038
All	-242	-10	-0.008	-1,356	-19	-0.019
AGI (000s)	Panel C: Two dependents under age 17			Panel D: > three dependents under age 17		
0-10	0	-2	0.000	0	-1	0.000
10-30	-605	-12	-0.032	-255	-3	-0.010
30-50	-1,448	-54	-0.034	-2,086	-46	-0.048
50-75	-1,533	-74	-0.025	-2,050	-141	-0.033
75-100	-1,962	-37	-0.022	-2,461	-73	-0.029
100-150	-2,135	-18	-0.017	-2,412	-26	-0.019
150-200	-3,373	-15	-0.020	-4,528	-21	-0.025
200-400	-7,947	-17	-0.031	-16,756	-23	-0.049
> 400	-17,672	-15	-0.038	-19,567	-17	-0.042
All	-1,793	-23	-0.023	-2,253	-32	-0.029

Source: American Housing Survey (AHS) data and authors' calculations.

