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The Tax Cuts and Jobs Act: the fairest of them all?

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ABSTRACT

This study explores how the tax law changes made through the Tax Cuts and Jobs Act of 2017 (TCJA) had an impact on horizontal equity within the tax system. Through simulations of the "typical taxpayer," or the median situated taxpayer and homeowner, homeownership tax benefits were computed using the TCJA law as well as the prior tax law. This was completed for both single and married filing joint taxpayers. The typical taxpayer's benefits under each tax law were compared across various regions of the country to evaluate how horizontal equity had been changed. The simulations' findings indicate that as a result of the tax law changes, horizontal equity increased for the typical married filing joint taxpayer, whereas the typical single filer did not achieve an increase of horizontal equity. The findings suggest that the improvement to horizontal equity under the TCJA is primarily due to the doubling of the standard deduction. The findings also suggest that Pierce's proposition (1989), to place greater limitations or even elimination of the homeowner subsidy completely, would have resulted in a greater improvement to horizontal equity.

INTRODUCTION

On December 22, 2017 the Trump administration signed into law the Tax Cuts and Jobs Act of 2017 (TCJA). It has been widely stated that this tax reform is the largest since that of the Tax Reform act of 1986. The TCJA, made many changes to the tax law. Changes were made to the individual tax brackets, the corporate tax rate, the elimination of the personal exemption, the doubling of the standard deduction, and many other modifications. One of the areas of taxation that received revamping was the homeowner tax subsidy, including the qualified residence interest deduction and limits on the deductibility of property taxes. Indirectly, changes made to the standard deduction also impacted the homeowner tax subsidy.

The purpose of this thesis is to critically evaluate the impact the TCJA has had on the amount taxpayers are able to deduct for mortgage interest and property taxes, and how this differs among various geographic regions. This is conducted through simulations which compare the tax benefits attained following the enactment of the TCJA to the benefits that had existed under prior tax law. The simulations utilize the changes in tax law while also making assumptions on the type of filer, the amount of mortgage that the filers would have based upon their geographic location, and the year of the mortgage. A comparison of the tax system prior to the TCJA is compared to the system enacted by the TCJA. Whichever reform proves economically more equitable for taxpayers will be considered the more effective system.

LITERATURE REVIEW

A main theme of my study is tax equity. Due to its prevalence in the study, it is important to understand how equity is defined and used in relation to the tax system. In their work, "Measuring the Size and Distributional Effects of Home Owner Tax Preferences," Ling and McGill (1992) analyze the effects on tax equity that would occur should the deductibility of mortgage interest be altered. The authors provide an exploration of tax equity and offer an example of how to measure it. As defined within the scope of homeowner subsidies, "Horizontal equity requires that owning households with equivalent incomes receive equivalent amounts of homeowner tax savings" (Ling & McGill, 1992). In other words, the tax deductions realized by people in similar economic situations should be the same, or very similar. The authors suggest that variation in homeowner tax savings is the best way to quantify inequities in the tax system.

To calculate the impact on equity under the TCJA, this study utilizes Ling and McGill's suggestion to evaluate variation in homeowner tax savings.

To further understand what factors have the potential to affect equity within a tax system, a paper published in 1989, "Homeowner Preferences: The Equity and Revenue Effects of Proposed Changes in the Status Quo," attempts to measure how amendments to homeowner preferences has an impact on horizontal equity, vertical equity, and government revenue (Pierce, 1989). Pierce's study defines horizontal and vertical equity quite similarly to other studies, "horizontal and vertical equity refer to the equal tax treatment of equally situated taxpayers and the acceptable relative treatment of unequally-situated taxpayers, respectively" (Pierce, 1989). The study concluded that policy options that limit and or eliminate the mortgage interest and property tax deductions seem to have positive impacts to both horizontal and vertical equity, as well as positive impacts to revenue. The findings of Pierce's study correlate well with the changes made by the TCJA and was instrumental in the formation of this study's hypothesis.

The ideas and methods utilized in this study are inspired by that of the previous studies mentioned studies and insights from more recent studies. A significant study was published in October of 2013 titled, "Home Owner Income Tax Benefits Vary by Region" (Krumwiede and Witner, 2013). The authors evaluated the mortgage interest deduction, deduction for property taxes, and the exclusion of gain from a primary residence. They used their evaluations to draw conclusions regarding the tax equity of the mortgage interest deduction. Determining that the system was inequitable, the authors offered two reasons why, the standard deduction, and geographical variations in home prices. Since that study, the standard deduction has doubled in size and greater limitations have been placed on itemized deductions. The conclusion of Krumwiede and Witner's study is probably modified by the TCJA. As a result, this study aims to determine if the standard and itemized deductions, like the homeowner subsidy, still have the negative impact on equity under the TCJA that was seen by Krumwiede and Witner (2013).

A different yet comparable study from 2007, "Geographical Equity Effects Of the Homeowner Tax Subsidy," offers insights into how various components of the tax system have an impact on both horizontal and vertical tax equity (Krumwiede, et. all, 2007). First, the authors conclude that itemized deductions for mortgage interest and real property taxes diminish horizontal equity. Second, those individuals on the higher end of the tax bracket seem to benefit more from the homeowner subsidy than those at the lower end of the bracket diminishing vertical equity. Third, the variation in benefits is further impacted by geographic region. Using this study in corroboration with the 2013 study, it can be concluded that both the standard deduction and itemized deductions of the respective time periods appear to decrease equity in the system. The expectation of this study is that the adjustments made by the TCJA have altered the impact that the standard and itemized deductions have on equity, improving horizontal equity.

As seen in prior research, multiple sources have corroborated that the itemized mortgage interest deduction has had negative impacts on equity in the past. One source offers potential solutions to reducing the inequity produced by this deduction. In their study, "The Federal Tax Subsidy to Housing and the Reduced Value of the Mortgage Interest Deduction," Follain and Ling (1991) suggest two solutions to the vertical inequity produced by the mortgage interest deduction. They state, "This can be accomplished by reducing the maximum mortgage size for deducting interest from $ 1 million or by limiting the value of the mortgage interest deduction available to higher income households" (Follain and Ling, 1991). Although Follain and Ling wrote their study in 1991, the TCJA utilized one of their solutions, reducing the maximum mortgage size of the deduction. This study serves as a tool to evaluate Follain and Ling's findings through the perspective of horizontal equity.

This compilation of academic research offers insight into weaknesses in previous tax systems. It is important to juxtapose this previous research to the TCJA. This thesis exploits the differences enacted by the TCJA in order to understand if the findings by previous studies still stand or if there are different conclusions under the new law.

Some modifications to the homeowner subsidy, implemented by the TCJA, were completed using the qualified residence interest deduction. The qualified residence interest is an itemized deduction that is broken into two types of interest: acquisition indebtedness interest and home equity indebtedness interest. Acquisition indebtedness is the debt that is incurred to acquire, construct, or substantially improve a residence, and is secured by that qualified residence (Witner and Krumwiede, 2018). As briefly touched upon earlier, the interest that is deductible on acquisition debt was reduced. Acquisition debt that qualifies as an interest deduction was reduced from $1,000,000 to $750,000 for individuals, head of household, married filing jointly, and from $500,000 to $375,000 for those married filing separately ("TCJA").

Home equity indebtedness is any debt that does not fall under acquisition indebtedness and is secured by a qualified residence, not referring to the original residence from the acquisition indebtedness. The home equity indebtedness deduction also experienced changes from the TCJA. Prior to the TCJA, home equity indebtedness interest was deductible on debt that did not exceed either $100,000 for those single filers, head of household, or married filing jointly, and $50,000 for those filing separately. Following the act, home equity indebtedness interest may only be deducted provided it meets two criteria. First, interest is deductible if it is labeled a "home equity loan," "HELOC" (home equity line of credit), or a "second mortgage." Second, the loan must be used to "buy, build, or substantially improve the taxpayer's home that secures the loan, to the extent the loan does not exceed the limitation of acquisition indebtedness" (Witner and Krumwiede, 2018). This indicates that interest from the loan may not be deducted if the funds provided by the loan are used for any non-home related expenses.

Other TCJA changes that are important to note are as follows. First, the amounts of the standard deduction have nearly doubled. Prior to the TCJA, the standardized deduction for individuals and those married filing separately was $6,350, $9,350 for those filing as head of household, and $12,700 for those married filing jointly. Following the reform, these amounts have all increased. The standardized deduction for single filers and those filing separately is $12,000, $18,000 for heads of household, and $24,000 for those married filing jointly, these amounts are adjusted yearly for inflation. Second, deductions for state and local income and property taxes has changed. The preexisting law did not place a limit on the amount of these taxes that are deductible. The TCJA however, states that the total deduction for state and local taxes and property taxes may not exceed $10,000. A breakdown of the tax law changes is in figure one of the appendix.

With the significant changes to the tax law following the TCJA, a question on researchers and taxpayers' minds is what are the ramifications of these changes? With aims to answer this question, this thesis will focus on what adjustments to tax equity has occurred with the TCJA reform. While the prior studies have demonstrated the lack of tax equity in the system, specifically in relation to the qualified residence itemized deduction and property tax, equity has not yet been evaluated under the TCJA. This study aims to fill that gap in the research.

DATA SOURCES

Running the simulations required various assumptions and data collection. Assumptions are necessary because it would be nearly impossible to run simulations that are representative of every taxpayer's situation. In this study, the focus is on depicting the typical, or median situated taxpayer. This means only the itemized deductions of a typical taxpayer in the simulations were considered. These deductions include mortgage interest, property taxes, state and local income taxes, and charitable contributions. Through data compilation, assumptions were made regarding mortgage amounts, interest rates, home price, state and local income taxes, and other factors to create a median sample of the population.

Regions and Home Prices

The first determination made was what geographic regions should be included in the simulations. One goal of using different geographic regions was to try and gain conclusions about whether benefits received from the changes in the homeowner subsidy are more favorable for taxpayers in low or high income areas. Four geographic regions were chosen based on their income levels and state income tax requirements. Using data provided by the United States Census Bureau, information was gathered for the 2018 and 2017 median household income for multiple metropolitan areas in the country (Guzman, 2019). Based upon the income levels, four cities were chosen, the highest income, lowest income, and two that had roughly the average income of the listed metro areas. The high-income city is San Francisco, the low is Tampa, and the average income cities are Dallas and Atlanta. Due to state income tax regulations, discussed later, it was advantageous to include two cities at the average income level.

Once the regions were determined for the simulations, home price data was needed that was representative of the mean or median homeowner in each of these regions. Throughout the simulations two different home price methods were used. Initially information was utilized, using the per city indexes, provided by the Case Shiller Home Price indices. The Case Shiller Home Price indices are economic indicators that measure the change in price of single family detached residences using the repeat sales method (Caldwell, 2013). The repeat sales method simply compares the sale price of each residence over the course of time. Case Shiller only includes sale of homes that occur at arms-length transactions, meaning that the home was sold at market value in order to provide an accurate representation of the housing market at that time. Case Shiller provided home prices representative of the average homeowner in years 2018 and 2017 in each of the four cities. However, because Case Shiller is an index based on average home prices, it would not provide as accurate results as the study was aiming for. Averages are often influenced by the existence of outliers, in this case, homeowners with very expensive or inexpensive housing, that would alter the average so that it is not truly representative of the typical homeowner and taxpayer.

The more accurate way to represent the typical homeowner in each region would be to utilize median housing data. The Kiplinger Washington Editors obtained data from the U.S. census and published a breakdown of the median home prices of the top 100 largest metropolitan areas ("Home", 2020). The list included all four regions utilized in this study and provided median information for 2018. Kiplinger also provided the percent change in home price from 2017 so that the median home price in 2017 could be calculated for these regions as well. While the median home price is a more accurate representation, for comparison and completion purposes both the data provided from Kiplinger and Case Shiller was used as a proxy for home prices in the simulations, with only Kiplinger data being used in the final analysis. These house prices are used to calculate the amount of a typical mortgage loan in each of the regions for 2018 and 2017.

Itemized Deductions

The next assumption made was taxpayer mortgage amounts. To calculate the mortgage interest deduction, an inference was made about the actual mortgage that would exist. For this purpose, roughly 80% of the home value was presumed to be the total mortgage loan. The total amount of this loan varies among regions based upon the calculated median home price for that region. All mortgage loans in the simulations are assigned a four percent interest rate. This interest rate was determined using Value Penguin to calculate an average of mortgage rates over the last ten years and rounded to four percent (Ceizyk, 2020). This allowed an estimation of deductible interest expense. The simulations considered interest expense for year one and year ten of the mortgage to evaluate if that had any significant impact on the tax benefits received under each of the tax legislations.

Once home prices were established, property taxes for each of the four regions were estimated. Using data provided by Wallethub, the effective real-estate tax rate for each state was gathered (Kiernan, 2019). This enabled the estimation of property tax for each of the four cities, which takes the total home price multiplied by the property tax rate. San Francisco's property tax rate is 0.77%, Dallas is 1.83%, Tampa is 0.98%, and Atlanta is 0.91%. Property tax rates were assumed to have remained the same for 2017 and 2018.

Next, state income taxes were estimated. Only two of the regions in this study, San Francisco and Atlanta, are subject to state income taxes. Due to the complexities of the state income tax brackets, information provided by the Statistics of Income served as a proxy for state and local income taxes ("SOI Tax Stats", 2020). SOI breaks down information based upon income level and provides information to calculate the average state income tax for a particular income bracket in each state. Data for San Francisco and Atlanta, from 2017, was used to calculate the average tax rate. The calculated tax rate was multiplied by San Francisco and Atlanta's 2018 and 2017 median income to find the respective year's state income tax. Note that this number is a proxy for the metropolitan areas state income taxes, 2017 numbers represent actual data while 2018 was slightly modified. These modifications were made assuming that minor adjustments to income and state tax brackets from 2017 to 2018, would not make a material difference in the calculation of state income taxes between each year.

Finally, charitable contributions were considered. Charitable contributions can be deducted as an itemized deduction. The simulations assume the amount of an average charitable contribution on a state basis. Using data from the Internal Revenue Service's statistics of income, the average contribution for each of the four states corresponding to the four regions used was calculated ("SOI Tax Stats", 2020). The average used was by state and income level. The calculated average is derived specifically from charitable contribution averages by state at the median income levels that are used for each of the four regions. The IRS published this data in 2017 so it was adjusted for inflation to 2018 numbers using the CPI-U index.

<u>EXPECTATIONS</u>

The overall goal of this thesis, as stated before, is to draw conclusions if equity has increased or decreased as a result of the TCJA. It is hypothesized that the TCJA improves horizontal equity.

ANALYSIS

Calculation of the homeowner benefit

To evaluate equity, the tax benefit of homeownership was calculated for taxpayers in the four regions. The following describes the method used to calculate their tax benefit. Total itemized deductions that the taxpayer would receive was calculated. Total itemized deductions were a sum of deductible mortgage interest, property taxes, state income taxes, and charitable contributions. Total itemized deductions were then compared to the standard deduction for the respective tax year (standard deduction amounts are presented in figure one of the appendix). If the taxpayer was unable to itemize because the standard deduction was greater than that of the total itemized deductions, the benefit of owning a home is zero for that taxpayer. For the taxpayers that were able to itemize, (i.e., itemized deductions exceeded the standard deduction), the calculation is broken down into two categories.

The first category describes taxpayers that would not have elected to itemize if they did not receive deductions from homeownership. In other words, if the taxpayer did not include mortgage interest and property taxes to their itemized deductions, the total itemized deductions would no longer exceed that of the standard. In this case, the benefit of owning a home is the difference of the tax liability incurred by this taxpayer if they used the itemized deduction versus if they used the standard deduction. This was calculated by subtracting the total of itemized deductions from the adjusted gross income to get taxable income. Using the respective year's federal tax brackets, which can be found in figures two through five of the appendix, federal tax liability was calculated. The same process was completed using the standard deduction for that taxpayer. The difference between the federal tax liability associated with itemized deductions and the federal tax liability associated with the standard deduction is the benefit of owning a home for this taxpayer.

The second category is those taxpayers who could elect to itemize even without the inclusion of deductible mortgage interest and property taxes. For this taxpayer, even without the homeowner deductions, the taxpayer would have itemized deductions exceeding the standard deduction. In this case, the benefit of owning a home, is the difference between the tax liability using all itemized deductions (deductible mortgage interest, property tax, state and local income taxes, and charitable contributions), versus the tax liability using only the itemized deductions not associated with homeownership (state and local income taxes, and charitable contributions.)

This process was completed 32 times. Evaluating the median taxpayer in four cities in 2017 versus 2018 for taxpayers at two different points in their 30-year mortgage, year one and year ten. This process considered two different types of filers, single and married filing jointly. The following breaks down the findings of this process and how it provided insights regarding tax equity.

<u>Single tax filers, 2017 versus 2018</u>

The findings for single tax filers and their benefit received through homeownership can be found in figures six and seven of the appendix, broken down by region. Figure six shows the benefit that would exist if the taxpayers were in the first year of their mortgage while figure seven shows the benefit that would exist if the taxpayers were in their tenth year of the mortgage.

For all the simulations, the size of the standard deduction had a great impact on the benefits received from homeownership. As discussed above, in order to receive a benefit from homeownership one must have itemized deductions that exceed that of the standard. In other words, the standard deduction indirectly has as great impact on the size of the benefits that can be attained through homeownership. This explains why the doubling of the standard deduction from $6,350 for single filers in 2017 to $12,000 in 2018, made it much harder for taxpayers to itemize, resulting in significant changes to the size of homeownership benefits for all regions in the study. Throughout the analysis, it will be evident that while the doubling of the standard deduction impacted the benefits received for single filers, it altered the homeownership benefits received for married filing jointly filers even more.

In all geographic regions, the single filers benefit from owning a home is greatest in year 2017 during the first year of the mortgage. The 2017 tax legislation did not place a limit on the amount of deductible property tax (like there is in 2018). This allows for the total amount of property tax in each region to be deducted from the taxpayers adjusted gross income. This increases the benefit that taxpayers received from owning a home by the amount of that deduction multiplied by their tax rate.

Additionally, the 2017 tax legislation allows interest to be deducted on a greater amount of acquisition indebtedness. This part of the law did not come into play in the simulations however, because no mortgage considered had exceeded the limit of $750,000 in 2018 or $1,000,000 in 2017. However, deductible interest on acquisition indebtedness explains why the benefit of owning a home during the first year of the mortgage is greater than in year ten.

Over time, the interest borrowers pay on their mortgage will decrease because with each payment on the loan, the balance of principle outstanding decreases. As principle decreases, the amount of total interest paid on that principle declines. When the amount of interest that can be deducted is high, it positively impacts the benefit of owning a home because the deduction helps to reduce taxable income and, by extension, reduces the federal tax liability. That reduction in tax liability is attributed to homeownership. Considering these factors, it is evident that the benefit of owning a home is greatest overall when the taxpayer is in the first year of their mortgage and filing in 2017.

The largest benefit of owning a home, no matter the filing year, is realized by San Francisco homeowners. This is attributed to the fact that although the simulations all depict the median or typical taxpayer for each of the geographic regions, San Francisco has the highest cost of living. This means that San Francisco's property values will be higher than that of the other regions, and thus the property taxes, mortgage, and deductible mortgage interest will be greater. This allows San Francisco's itemized deductions to be driven up by the value of a home, resulting in a higher benefit from owning a home.

San Francisco's 2018 benefit of owning a home is less than that of San Francisco's 2017 benefit. For example, the benefits in 2018 and 2017 during year one of the mortgage are, $6,690.00 and $7,769.17 respectively. As briefly touched upon before, there was no limit placed on property taxes and state and local taxes under 2017 tax law providing higher itemized deductions in 2017. This made it easier for the taxpayers to itemize. With the TCJA laws applying in 2018, it placed a $10,000 limit on property taxes and state income tax deductions. This partially eliminates the extra benefit that areas with higher property values might receive from this itemized deduction relative to areas with low property values. Additionally, as mentioned earlier, not all states have an income tax. For example, Dallas and Tampa are both in states without state income taxes. This limit also partially eliminates some of the extra benefit that regions with an income tax could receive in the form of a state and local income tax deduction compared to regions that do not have one. Only San Francisco was impacted by the limitation on state income and property tax deductions in the simulations.

In contrast to San Francisco homeowners, Tampa homeowners received the smallest benefit in both tax years out of the geographic regions in this study. In 2017, benefit was $1,084.96 for year one of the mortgage, and $914.92 for year ten. In 2018, Tampa homeowners did not receive a benefit from homeownership for either mortgage year. Tampa has the lowest cost of living in this study. This results in the lowest amount of property taxes, paired with the smallest mortgage loan as well as the smallest amount of deductible interest. With lower deductions attributable to owning a home, the tax benefit from owning a home is lower.

Even though each region saw a decrease to their benefit in 2018, only Tampa realized a complete elimination of homeownership benefits. Remember that for a taxpayer to receive homeownership benefits, they first must have total itemized deductions that exceed the standard deduction. A single filer in Tampa will write off less in mortgage interest and property tax. They cannot utilize the state income tax deduction because Tampa is not subject to a state income tax. Tampa is also less likely to write off as much in charitable contributions because their median income level is the lowest of the sample. These factors make it more difficult for Tampa to have itemized deductions that exceed the standard deduction. While itemizing was already difficult in 2017, couple this with the doubling of the standard deduction in 2018, and it was nearly impossible for the median single filer in Tampa to itemize in 2018. This resulted in the elimination of their homeownership benefits for Tampa homeowners.

After juxtaposing the situations of San Francisco and Tampa taxpayers, it is evident that the changes to the TCJA tax law had an impact on homeowner benefits across the United States. Although all the simulations depict the median taxpayer, each region varies in the cost of a home and standard of living. So, comparing homeownership benefits in monetary terms is not the best way to approach this question. To understand how equity had been impacted, homeownership benefits were analyzed as a percentage of income and home price for each of the taxpayers.

The graphical analyses for homeownership benefits as a percentage of income can be found in figures eight through ten of the appendix. Figure nine expresses the benefit as a percentage of income for each of the cities in tax year 2017 (indicated in blue) and 2018 (indicated in orange), for year one of the mortgage. In tax year 2017, the benefit as a percent of income ranges over the four regions: San Francisco at 7.64%, Dallas 2.55%, Tampa 2.08%, and Atlanta 3.01%. This can be interpreted that for every dollar in income, San Francisco receives seven cents, Dallas two and a half cents, Tampa two cents, and Atlanta three cents in homeowner benefits. As discussed, state and income taxes as well as higher home values can positively impact monetary homeownership benefit, but this is also depicted when looking at benefit as a percentage of income. San Francisco and Atlanta have greater itemized deductions (since they include state and local income tax deductions), so they are more likely to continue receiving a benefit from homeownership because they are more likely to continue itemizing even with the tax law change. This also contributes to the fact that they are more likely to have a benefit that is greater in relative size to other regions of the country without state and local taxes.

Looking at tax year 2018 in figure nine, it is evident that San Francisco and Atlanta are still receiving a benefit from homeownership, whereas Tampa is not. Even with the limit placed on state and local taxes in 2018, regions with a state income tax continue to benefit because the presence of this deduction continues to help taxpayers reach the needed threshold to itemize. As previously discussed, homeownership benefits decreased across all regions, therefore, the benefit as a percent of respective income is lower for all regions. The benefit is now 6.28% of income in San Francisco, 0.62% in Dallas, 0% in Tampa, and 1.36% in Atlanta. In effect, this means that for every dollar of income, San Francisco is receiving six cents in homeowner benefits, Atlanta receives just over one cent back, Dallas a half a cent, and Tampa receives nothing. It appears that the changes in benefit as a percentage of income impacts the areas with lower home values and no state income taxes the most, and those with higher home values as well as a state income tax the least.

Take Dallas and Atlanta for example. Both Dallas and Atlanta have the average median income for the largest metropolitan areas (both incomes hovering around $69,400 in 2018), with similar home values (Atlanta's being slightly higher). These two areas would be considered quite comparable, other than the fact that unlike Dallas, Atlanta is subject to a state income tax. One would expect that these two regions' benefit, expressed as a percentage of income, would be relatively equivalent, since they exist in such similar positions. But as indicated above, Atlanta received a higher benefit in both years. As a percentage of income, the benefit in Dallas decreased by 1.93% of income from 2017 to 2018, and Atlanta only decreased by 1.65%. While this is not a large distinction, it can be inferred that the reason Atlanta lost less of its benefit is due to the state income tax, and its slightly higher home value.

Considering a homeowner in year ten of their mortgage, the variation in benefit as a percentage of income between the regions narrows. Looking at figure ten, the benefit of owning a home as a percentage of income is displayed for each of the cities in tax year 2017 (indicated in green) and 2018 (indicated in light blue). In tax year 2017, the benefit as a percent of income is 6.88% in San Francisco, 2.28% in Dallas, 1.75% in Tampa and 2.72% in Atlanta. In tax year 2018, the benefit is 5.51% of income in San Francisco, 0.38% in Dallas, 0% in Tampa, and 1.08% in Atlanta. Similar to before, the overall benefit is decreasing between the tax years, and the areas with no state income tax and lower home values are realizing the greatest monetary loss to their benefit. The change in benefit loss from 2017 to 2018 among the geographic regions, however, are much similar in year ten than in year one of the mortgage. Dallas, Tampa, and Atlanta each realized a 1.90%, 1.75%, and 1.64% loss of their benefit as a percentage of income respectively. This is narrower than the change in benefit loss in year one of the mortgage, which was a loss of 1.93% for Dallas, 2.08% for Tampa, and 1.65% in Atlanta. While Tampa realized a great loss to their benefit as a percentage of income in year one of the mortgage, their loss in year ten is smaller than the loss experienced by Dallas homeowners. Despite experiencing such a great loss relative to their income, Dallas homeowners are still receiving a positive homeownership tax benefit.

Overall, as the benefit of owning a home decreases in all regions, it does not indicate an improvement of horizontal equity in the system. Recall that for horizontal equity to exist, homeowners in equal positions must realize the same or similar homeownership benefit. Homeownership benefit, expressed as a percentage of income, is more alike in 2017 than it is in 2018. For example, look at homeowners in year one of their mortgage. In 2017, Dallas, Tampa, and Atlanta homeowners are all receiving between two to three percent of their income in homeownership benefits. In 2018, these regions are more dissimilar with Dallas receiving 0.62%, Atlanta 1.36% and Tampa 0% of its income in benefits. In both years, San Francisco is an outlier receiving a much larger percent of its income in homeownership. However, the fact that three out of the four regions are more similar in 2017 indicate that horizontal equity, for single taxpayers, was not improved in 2018 as a result of the TCJA.

Consider this same reasoning but from a different perspective. A graphical analysis depicting the benefit of owning a home as a percentage of home price can be found in figures eleven through thirteen in the appendix. Similar to benefit as percentage of income, benefit as a percentage of home price is largest in 2017 when looking at mortgage year one, and smallest in 2018 looking at mortgage year ten. In 2017 mortgage year one, even though San Francisco has the greatest monetary benefit, Atlanta receives the greatest benefit as a percentage of home price (San Francisco's is 0.69% of home price, and Atlanta is 0.78%). A median homeowner in San Francisco has a higher cost of living than median homeowners in Atlanta, making their home price much larger. So, while San Francisco's monetary benefit may be the highest, Atlanta homeowners are receiving the greatest benefit when compared to their home value.

Focus attention to figure twelve which displays benefit as a percentage of home price for mortgage year one. The benefit as a percentage of home price from 2017 to 2018 in Dallas, Tampa, and Atlanta decreased by by 0.46%, 0.48%, and 0.43% respectively. Meanwhile, San Francisco only realized a 0.15% decrease. It appears that benefits for all regions were impacted by roughly the same amount, except for San Francisco. Areas with high costs of living benefit from high mortgage interest and property tax allowing the taxpayers to more easily itemize and have a greater monetary benefit. This study also found that not only do high cost of living areas have a greater monetary benefit, but this benefit is a greater portion of their home price than in lower cost regions. This explains why San Francisco's benefit, as a percent of home price, decreased by a smaller margin than the other three regions from 2017 to 2018. This finding indicates that areas with greater costs of living, benefit from owning a home more than areas with lower costs of living. This extra benefit decreases over the life of the mortgage. This is indicated by a decreased benefit of homeownership as a percentage of home price for San Francisco during year ten of the mortgage in figure thirteen. While the extra benefit is decreasing over the life of the mortgage, it is still evidently larger in San Francisco than the other regions.

When evaluating homeownership benefits as a percentage of home price, to make determinations about equity, it follows the same patterns as when looking at the benefit as a percent of income. Considering a homeowner in year one of their mortgage, homeowner benefits as a percent of home price is 0.69% in San Francisco, 0.60% in Dallas, 0.78% in Atlanta, and 0.48% in Tampa in 2017. In this case, San Francisco, Dallas, and Atlanta are quite alike, with Tampa homeowners trailing a bit behind in benefits relative to their home price. This is in contrast to 2018 where benefit as a percent of home price is 0.54% in San Francisco, 0.14% in Dallas, 0.35% in Atlanta, and zero percent in Tampa. The benefits received in San Francisco, Dallas, and Atlanta are less alike in 2018, with these three regions having a 0.40% range, whereas in 2017 the range among these three regions was 0.09%. In other words, the benefits under the TCJA are less equal than under prior tax law, which does not indicate an increase in horizontal equity for single taxpayers.

<u>Married Filing Jointly tax filers, 2017 versus 2018</u>

The findings for married filing jointly tax filers and homeownership benefits are summarized in figures 14 and 15 of the appendix, broken down by region. Figure 14 shows the benefit that would exist if the taxpayers were in the first year of their mortgage while figure 15 shows the benefit that would exist if the taxpayers were in their tenth year of the mortgage.

What differs for married filing jointly taxpayers is that they do not benefit from homeownership as much as single filers. Very few of the assumptions within the simulations change when considering married filing jointly taxpayers. The proxy for adjusted gross income is a median household income statistic. For the simulations' purposes, the same household income was used as a proxy for adjusted gross income for both types of tax filers. Being married also had no impact on the home price, size of the mortgage, property tax rate, the state and local income tax amount, or the size of the charitable contribution. The only major changes when considering married filing jointly taxpayers are the size of the standard deduction and the federal tax rates associated with filing jointly (these rates can be found in figures four and five of the appendix).

The standard deduction in year 2017 for married filing jointly is double that of single filers, at $12,700. Already, single filers will be more likely to itemize because it will be easier for their itemized deductions to exceed that of the standard deduction. This is more difficult in 2018 when the standard deduction practically doubles for all filers. In 2018, married filing jointly taxpayers must have itemized deductions that exceed the standard deduction of $24,000 in order to receive any benefit from homeownership. Furthermore, this explains why married filing jointly taxpayers are less likely to itemize within the simulations in tax year 2018.

The typical married filing jointly homeowners that were able to itemize include: San Francisco in both tax years, Atlanta in 2017, and Dallas in 2017 but only during year one of the mortgage. Married filing jointly homeowners in Tampa did not receive a benefit from homeownership. It appears that the interest deduction from year one of the mortgage for Dallas was enough to allow the taxpayer to itemize. But as interest decreases each year, Dallas could not elect to itemize in year ten of the mortgage for 2017. When the standard deduction doubled in 2018, with greater limitations being placed on the itemized deductions, the typical Dallas taxpayer was unable to itemize and failed to receive a benefit from homeownership. Atlanta had the state income deduction helping its ability to itemize, and that helped the homeowners itemize in 2017 throughout each year of the mortgage. In 2018, with a limitation being placed on the state income tax deduction, Atlanta's itemized deductions were too low to exceed that of the doubled standard deduction. Like Dallas, typical Atlanta homeowners lost their entire benefit from owning a home in 2018. In San Francisco, their high home value that resulted in high mortgage interest and property tax deductions, paired with a state income tax deduction, allowed these typical homeowners to itemize in all cases. San Francisco homeowners realized a decrease in their benefit in 2018, rather than a complete elimination.

Figures 16 through 18 displays married filing jointly homeowner benefits a percentage of income. Figure 17 depicts homeownership benefits as a percent of income during the first year of the mortgage in 2017 (in blue) and 2018 (in orange). Unlike single filers, benefits were eliminated in Dallas, Tampa, and Atlanta in 2018, as indicated by 0% of income. San Francisco maintained a benefit, but that benefit as a percent of income was reduced from 5.39% in 2017 to 2.51% in 2018. While San Francisco still holds a benefit unlike the other regions, it saw the benefit as percent of income decrease by the greatest margin. Even though San Francisco married filing joint taxpayers are still able to enjoy a tax benefit of owning a home, the 2018 benefits as a percentage of income are more similar across regions than 2017 benefits.

In 2017, while Tampa received no benefit, Dallas received .12% of income in homeowner benefits, Atlanta 0.58%, and San Francisco 5.39%. In 2018, with three of the four regions receiving the same percent of their income in benefits, and San Francisco's benefit reduced by half, the regions are experiencing more similar homeownership benefits. Over the life of the mortgage, San Francisco maintains a positive monetary benefit that decreases relative to its income. The other regions' benefits remain at zero in 2018. In other words, over the life of the mortgage, San Francisco's benefit as a percent of income, will become more alike the other regions. These factors make it evident that under TCJA the gap between benefits of the various regions closes over the life of the mortgaging, improving horizontal equity further.

The homeownership benefit for married filing jointly taxpayers was also evaluated as a percentage of their home price. In figure 19, the benefit of owning a home as a percentage of home price for each of the four regions is expressed in the following order: tax year 2017 mortgage year one, tax year 2017 mortgage year ten, tax year 2018 mortgage year one, and finally tax year 2018 mortgage year ten. This graph visually presents how horizontal equity increases in year 2018. In year 2017, mortgage year 1, you can see three of the regions (Atlanta, Dallas, and San Francisco) are all receiving a benefit, but the benefit is widely varied as a percentage of their home value. In 2017, in San Francisco, for example, typical homeowners are receiving half a cent for every dollar invested in the home, whereas Tampa homeowners receive nothing for every dollar invested in the home. While half a cent seems small, over the course of homeownership these benefits would add up, and San Francisco and Tampa homeowners who should be experiencing similar benefits would have a wide gap, increasing horizontal inequity in the tax system.

There is a vast improvement in equity in tax year 2018, mortgage year one, and even more in year ten. In 2018, three of the regions, Atlanta, Dallas, and Tampa, are all receiving the same benefit as a percent of their home price, zero. With three of the four regions receiving the same return on their home price, this indicates perfect horizontal equity. San Francisco receives a quarter of a cent in benefits for every dollar of home price in mortgage year one, and even less in year ten. Even though San Francisco is still receiving greater return than that of the other regions, that return has been cut in half from 2017, bringing it closer to the benefit as a percent of home price experienced by the other regions. These factors indicate that the TCJA is improving the horizontal equity of homeownership benefits. This increase in horizontal equity for the married filing jointly filers is primarily attributable to the doubling of the standard deduction. Not only did the doubling of the standard deduction create a situation where median homeowners in Dallas, Tampa, and Atlanta experience the same benefit from homeownership, but it also reduced the benefit that San Francisco homeowners would receive in excess of the other median situated homeowners. Increasing the standard deduction reduces the benefit that itemizers get by creating situation that results in more similar tax treatment among itemizers and non-itemizers. This ultimately improves equity for all median situated married filing jointly homeowners under the TCJA.

CONCLUSIONS

This study analyzed the effect on horizontal equity in the tax system following the changes made by the TCJA. Tax simulations of median taxpayers in various regions of the country determined that the TCJA has improved horizontal equity for married filing jointly taxpayers, but did not have the same effect for single filers. An increase in horizontal equity means that equally situated taxpayers, in this case, median income taxpayers with median valued homes of their location, are receiving more similar homeowner benefits than they had under previous tax legislation. While the TCJA has not been able to create a perfectly equitable system, the TCJA has been successful in improving horizontal tax equity for a portion of the United States citizens.

The tax simulations that lead to these conclusions only approximate the typical taxpayer. Actual tax return data was not available, so proxies were used for all of the data statistics used in this study. Proxies are an imperfect data source, so the results may be slightly skewed from the median taxpayer that the study aimed to depict.

While making determinations about tax equity, this study observed other effects the TCJA had on homeowner benefits. Homeowner benefits were decreased for all median taxpayers under the TCJA. The TCJA eliminated the homeowner benefits for median taxpayers in low cost of living areas with no state income tax. The median taxpayers living in areas with a higher cost of living, paired with a state income tax, maintained a benefit, but of a smaller size in 2018. High cost of living areas that realize high mortgage interest and property taxes receive a greater return per dollar value of their home than that of regions with low cost of living.

This study indicated an increase in horizontal equity for the median taxpayers who filed jointly but not for the single filers. This is indicated by the fact that in the four regions of the country, of the median taxpayers who filed jointly, three of the regions received the same benefit, and the fourth region received a benefit more similar to the other regions in 2018 (compared to 2017).Whereas median single filing taxpayers received more dissimilar benefits under the TCJA than under preceding tax law. The increase in equity for married filing jointly taxpayers is attributed to the doubling in the size of the standard deduction.

The findings were not able to make a clear determination about the impact that the limitation placed on the state income and property tax deduction had on horizontal equity. San Francisco was the only city really impacted by this limitation, and while the cities monetary benefits decreased for both filers, married filing jointly saw an increase to equity where single filers did not. Due to this variation, it is unclear whether this limitation had a positive or negative impact on equity at the median taxpayer level. This $10,000 limit may have a greater impact on equity at higher income levels.

These findings of the study do not entirely correspond with Pierce's findings in "Homeowner Preferences: The Equity and Revenue Effects of Proposed Changes in the Status Quo" (Pierce, 1989). Pierce stated that policy options that limit mortgage interest or property tax deductions seem to have positive impacts on horizontal and vertical tax equity. The TCJA put Pierce's suggestions into practice placing greater limitations of the mortgage interest deduction and introducing a limit on state income and property tax deductions. The findings of this study suggest that the limitations placed on these deductions were not great enough to have an impact on the median taxpayer and the improvement on equity was completely due to the doubling of the standard deduction.

Pierce's suggestions coupled with the conclusions of this study suggest that further limitations on the mortgage interest deduction, property tax deduction, and state income tax deductions could increase horizontal equity in the tax system at the median taxpayer level. As Pierce stated, the presence of limitations on the mortgage interest deduction would improve horizontal equity, and the TCJA did incorporate this suggestion by reducing the debt that interest is deductible on from $1,000,000 to $750,000. In this study, none of the mortgages considered exceeded the $750,000 limit. This means the limit placed on mortgage interest did nothing to impact homeownership tax benefits, and by extension had no hand in improving horizontal equity for the median taxpayer. To have an impact on equity, the debt that interest is deductible on should be reduced even greater so that it can improve horizontal equity among homeowners with median home values. Additionally, there should be an increased limit placed on the deduction for state income tax as well as property tax. The greater limit would reduce the inequities created between states that do not have an income tax and those who do, as well as reduce the inequities among high cost versus low cost of living regions when considering property taxes. These suggestions have the potential to further improve horizontal equity in the tax system.

Rather than placing further limitations, there is always the possibility of eliminating the homeowner subsidy completely to increase horizontal equity. By eliminating the subsidy, it would place regions like San Francisco, Dallas, Tampa, and Atlanta in more equitable situations when trying to itemize. As seen throughout the study, once the regions are on a more even playing field when trying to itemize, it resulted in an improvement in equity. Elimination of the subsidy would not only improve horizontal equity among equally situated homeowners, but it could also put equally situated taxpayers that do not own a home (i.e., renters) in a position to receive more similar tax treatment.

APPENDIX

Figure 1.

	Tax Laws Prior to TCJA	TCJA
Acquisition indebtedness interest	Interest deductible on debt up to: $1,000,000 (single, HOH, married filing jointly) $500,000 (married filing separately)	Interest deductible on debt up to: $750,000 (single, HOH, married filing jointly) $375,000 (married filing separately)
Home equity indebtedness	Interest deductible to extent debt does not exceed: • Fair market value of the residence • $100,000 (single, HOH, married filing jointly) • $50,000 (married filing separately)	Interest is only deductible given that: • it's labeled a "home equity loan", HELOC, or "second mortgage" • **AND** the loan is used to buy, build, or substantially improve the taxpayer's home that secures the loan (to the extend the loan doesn't exceed acquisition indebtedness)
Standardized deductions	$6,350 (single, married filing separately) $12,700 (married filing jointly) $9,350 (HOH)	$12,000 (single, married filing separately) $24,000 (married filing jointly) $18,000 (HOH)
Deductions for state and local sales income and property taxes:	No limit	Cannot exceed $10,000

Figure 2.

Federal Tax Brackets	
2018	
Single	
Taxable Income	Tax Rate
$0-$9,525	10%
$9,525- $38,700	12%
$38,700- $82,500	22%
$82,500-$157,500	24%
$157,500-$200,000	32%
$200,000-$500,000	35%
Over $500,000	37%

Figure 3.

Federal Tax Brackets	
2017	
Single	
Taxable Income	Tax Rate
$0-$9,325	10%
$9,325- $37,950	15%
$37,950- $91,900	25%
$91,900-$191,650	28%
$191,650-$416,700	33%
$416,700-$418,400	35%
Over $418,400	39.6%

Figure 4:

Federal Tax Brackets	
2018	
Married Filing Jointly	
Taxable Income	Tax Rate
$0-$19,050	10%
$19,050-$77,400	12%
$77,400-$165,000	22%
$165,000-$315,000	24%
$315,000-$400,000	32%
$400,000-$600,000	35%
Over $600,000	37%

Figure 5:

Federal Tax Brackets	
2017	
Married Filing Jointly	
Taxable Income	Tax Rate
$0-$18,650	10%
$18,650-$75,900	15%
$75,900-$153,100	25%
$153,100-$233,350	28%
$233,350-$416,700	33%
$416,700-$470,700	35%
Over $470,700	39.6%

Figure 6.

Single filer's monetary tax benefit from owning a home			
Mortgage Year	**City**	**2017 Benefit**	**2018 Benefit**
1	San Francisco	$7,769.17	$6,690.99
1	Dallas	$1,717.55	$432.90
1	Tampa	$1,084.96	$0.00
1	Atlanta	$1,969.04	$930.93

Figure 7.

Single Filer's monetary tax benefit from owning a home			
Mortgage Year	**City**	**2017 Benefit**	**2018 Benefit**
10	San Francisco	$6,998.56	$5,949.49
10	Dallas	$1,539.16	$264.77
10	Tampa	$914.92	$0.00
10	Atlanta	$1,780.10	$749.87

Figure 8.
Single filers: Homeownership benefits as a percentage of income, mortgage years one and ten

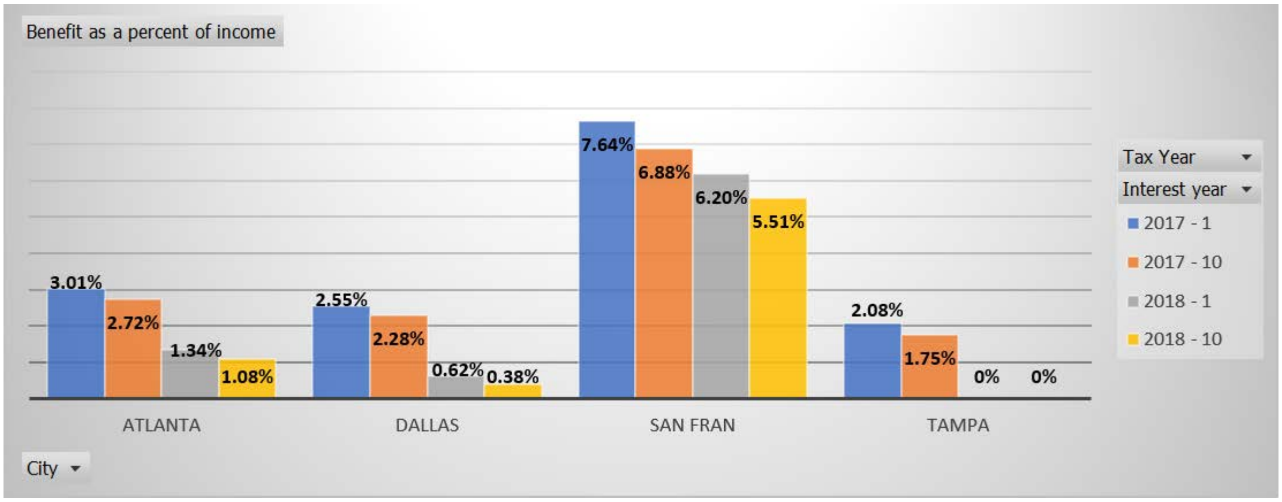


Figure 9.
Single filers: Homeownership benefits as a percentage of income, mortgage year one

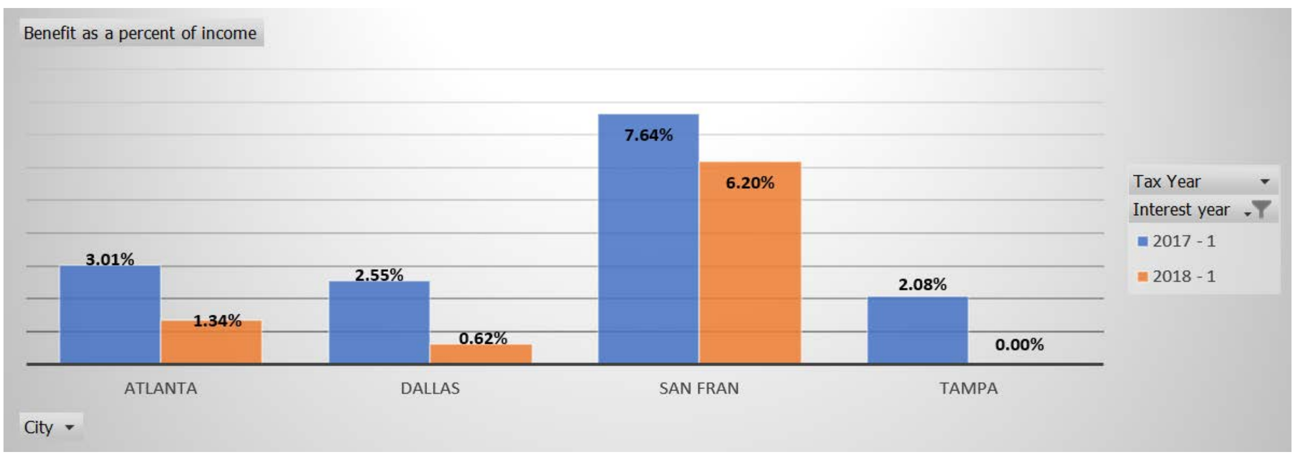


Figure 10.
Single filers: Homeownership benefits as a percentage of income, mortgage year ten

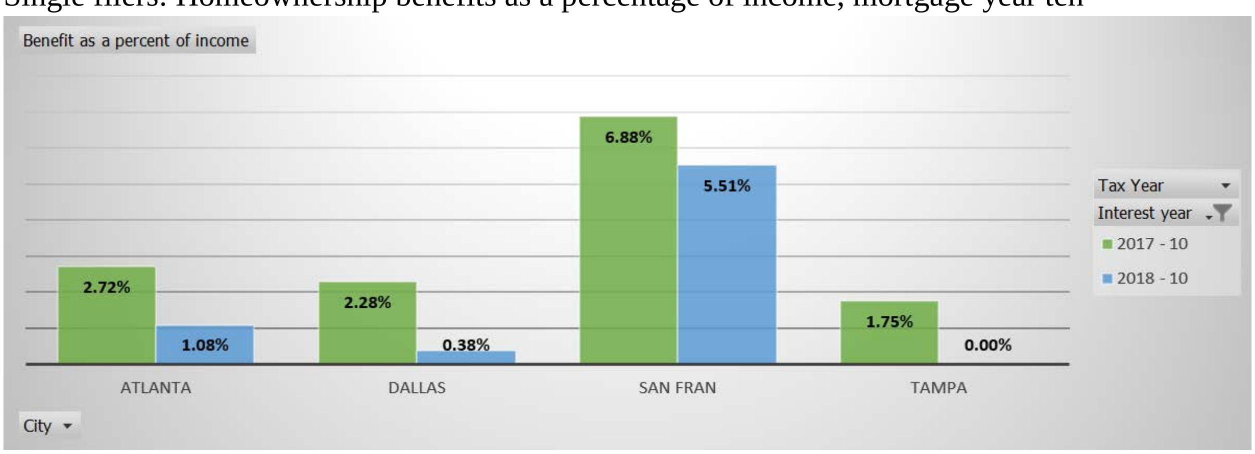


Figure 11.
Single filers: Homeownership benefits as a percentage of home price, mortgage years one and ten

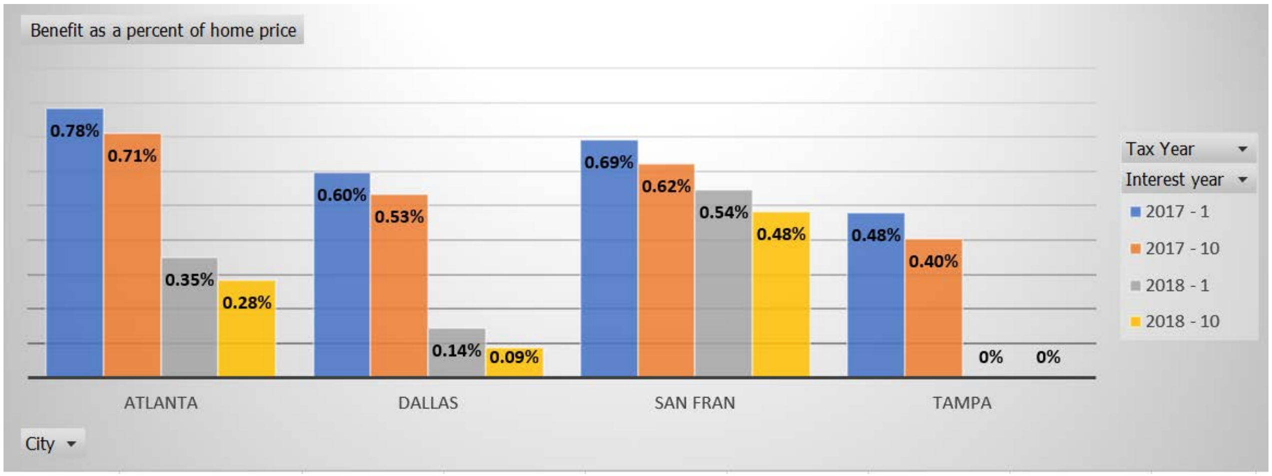


Figure 12.
Single filers: Homeownership benefits as a percentage of home price, mortgage year one

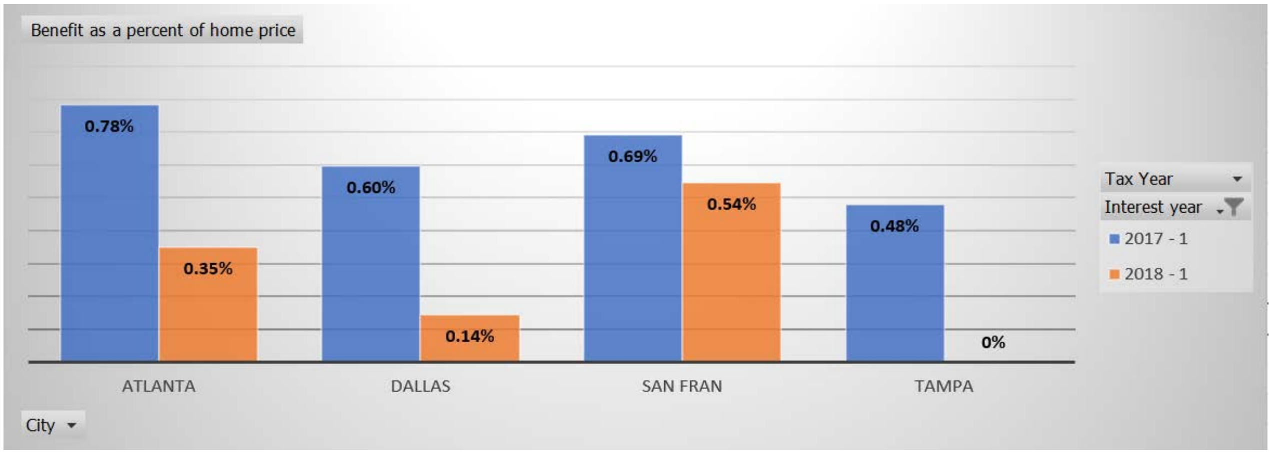


Figure 13.
Single filers: Homeownership benefits as a percentage of home price, mortgage year ten

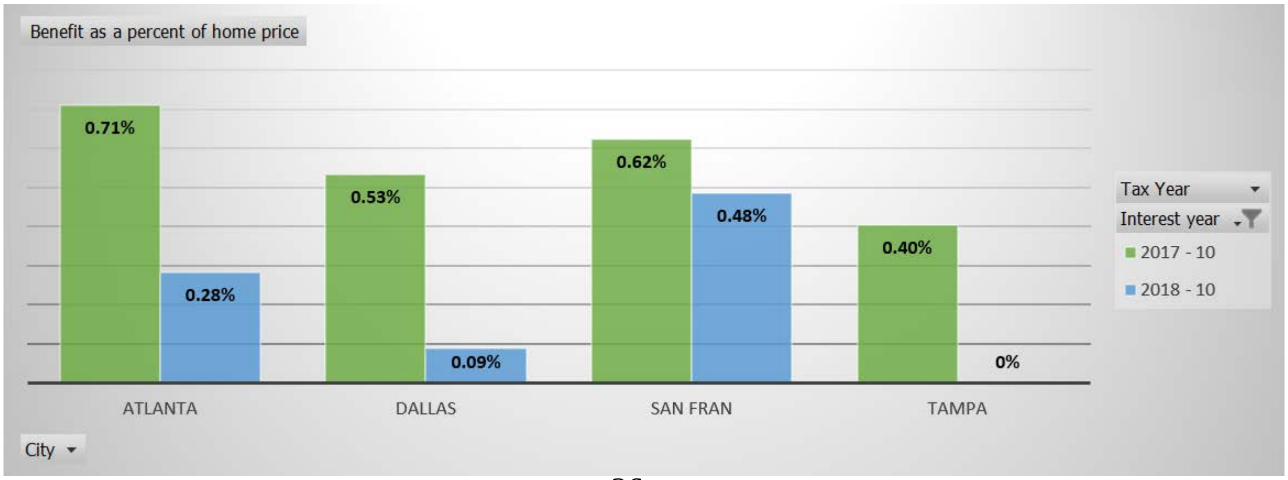


Figure 14.

Married Filing Jointly monetary tax benefit from owning a home			
Mortgage Year	**City**	**2017 Benefit**	**2018 Benefit**
1	San Francisco	$5,480.43	$2,713.27
1	Dallas	$78.03	$0.00
1	Tampa	$0.00	$0.00
1	Atlanta	$380.03	$0.00

Figure 15.

Married Filing Jointly monetary tax benefit from owning a home			
Mortgage Year	**City**	**2017 Benefit**	**2018 Benefit**
10	San Francisco	$3,017.88	$2,308.82
10	Dallas	$0.00	$0.00
10	Tampa	$0.00	$0.00
10	Atlanta	$266.66	$0.00

Figure 16.
MFJ filers: Homeownership benefits as a percentage of income, mortgage years one and ten

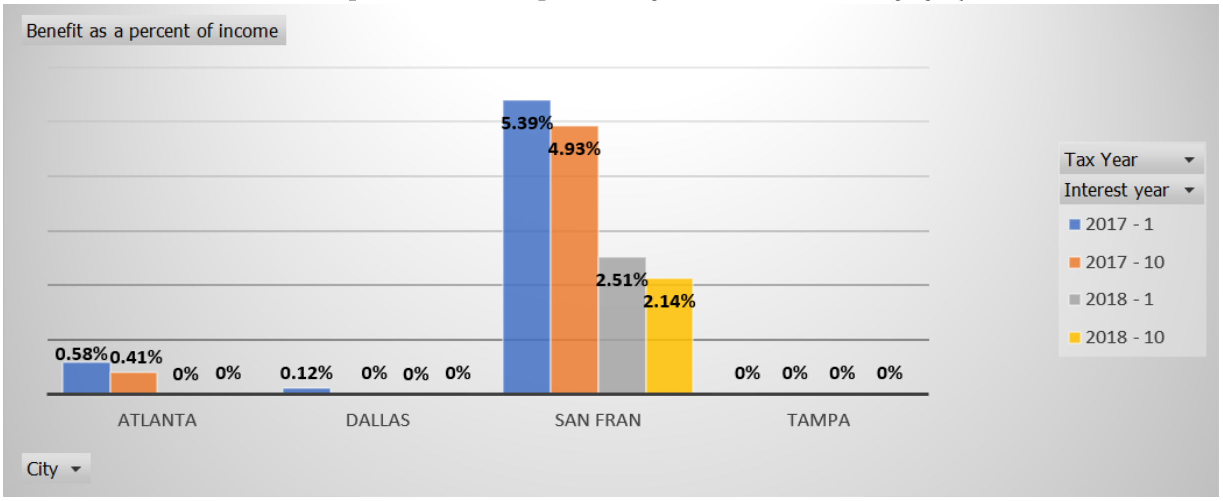


Figure 17.
MFJ filers: Homeownership benefits as a percentage of income, mortgage year one

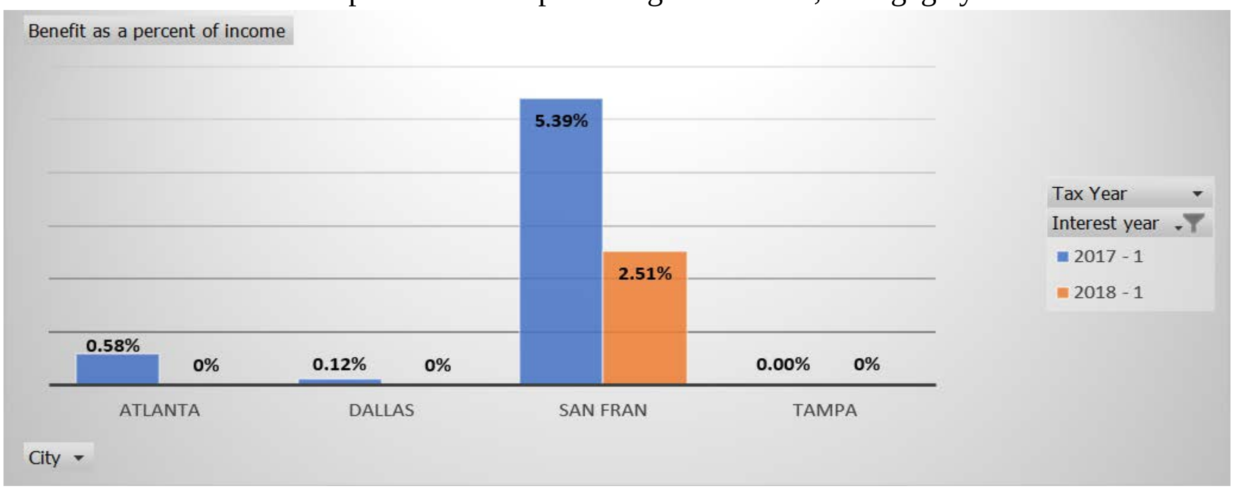


Figure 18.
MFJ filers: Homeownership benefits as a percentage of income, mortgage year ten

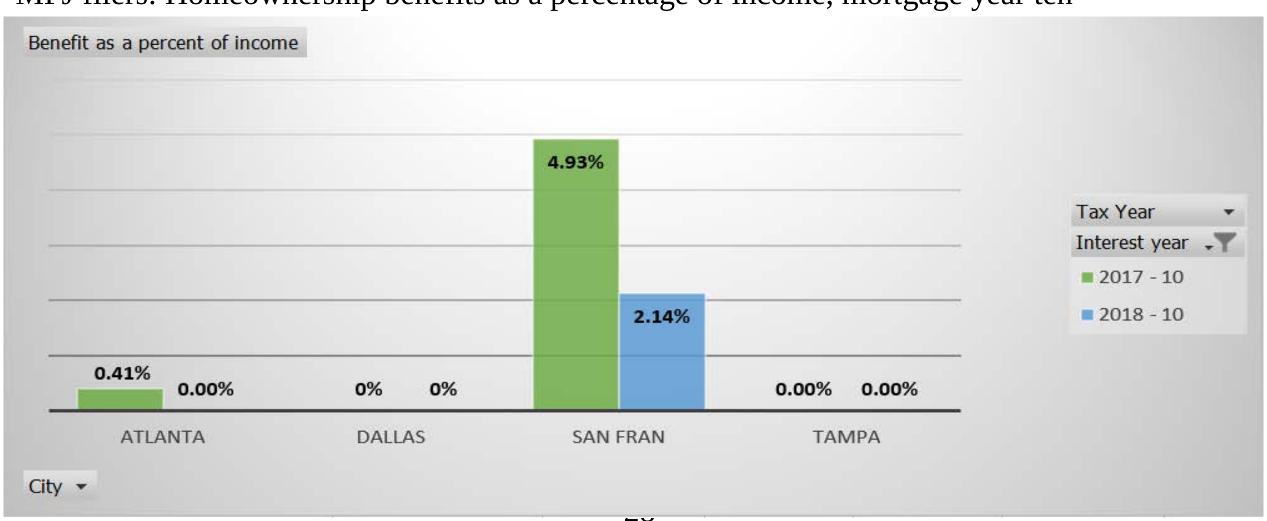


Figure 19.
MFJ filers: Homeownership benefits as a percentage of home price, mortgage years one and ten

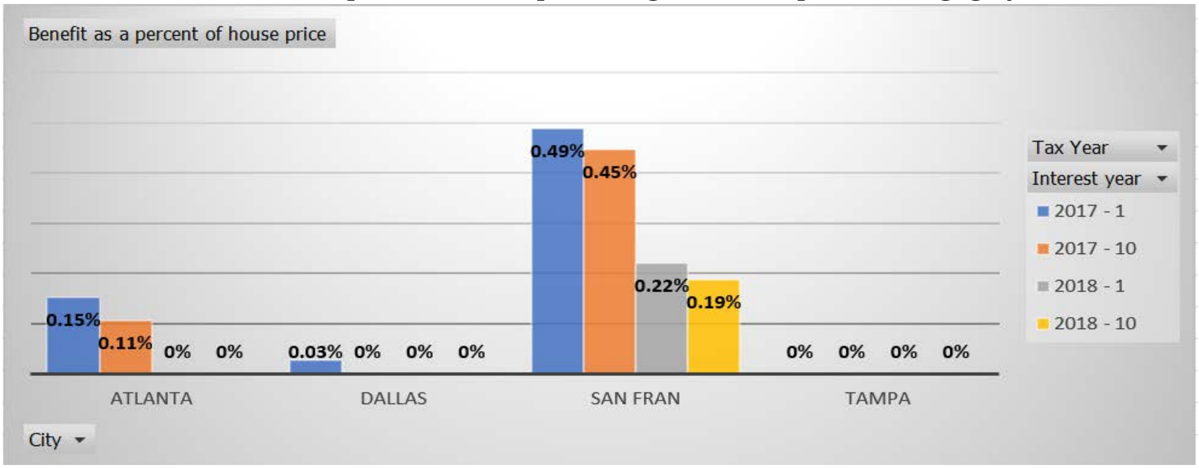


Figure 20.
MFJ filers: Homeownership benefits as a percentage of home price, mortgage year one

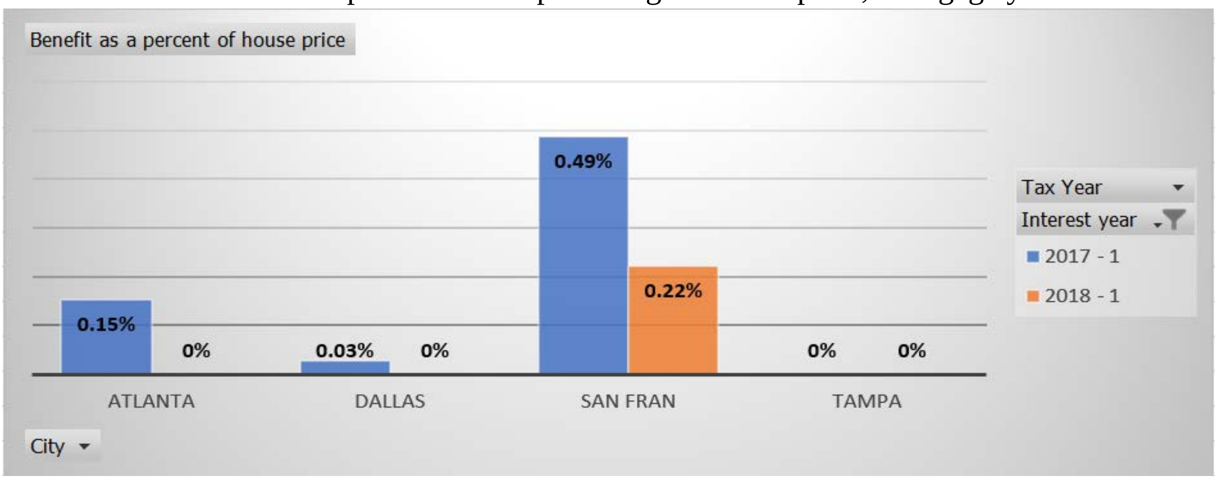
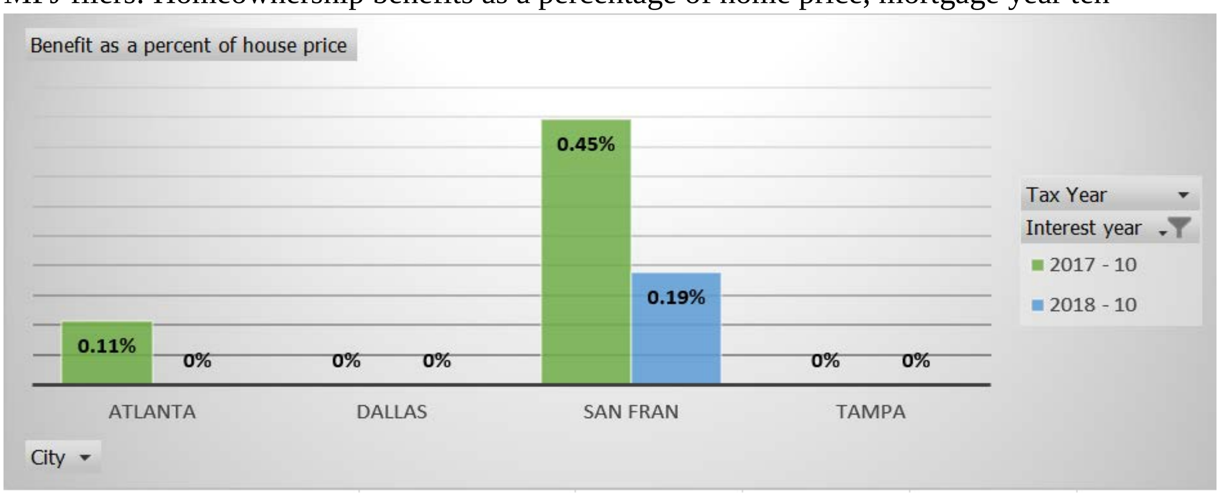


Figure 21.
MFJ filers: Homeownership benefits as a percentage of home price, mortgage year ten



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