Priced Out

Why Federal Tax Deductions Miss the Mark on Family Affordability

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Housing expenses are often the biggest single financial barrier to starting a family. Aspiring or expectant parents often require a greater amount of livable space to accommodate a new family member. In many parts of the country, that space comes at a premium. This increase in housing consumption is often coupled with a move from rental housing to owner-occupied housing.

However, skyrocketing home prices in recent years have made it difficult for many young adults to take this critical step. Particularly difficult is getting together a down payment, a large and growing challenge for young would-be homeowners. This report argues that tax policy aimed at making homeownership more affordable has increased the wealth of older Americans who own their homes, but by increasing home prices it has made homeownership less attainable for younger families, impeding family formation.

The problem is ultimately a product of the timing of income and spending over the life cycle. Prior to the COVID-19 epidemic, Americans were earning more than ever—typically enough to cover their housing costs over the long run, and to do so more easily than they did in the past. This will eventually be the case again once the epidemic recedes. However, even in normal times there are short- and medium-run mismatches between when income is earned and saved and when it is most needed. For example, people tend to earn the most in middle age, but they have expenses throughout their lives. This presents a challenge for young families, whose household heads have not yet reached middle age. While they have strong future earning prospects and can amortize most of their home costs over a long period at low mortgage interest rates, they are relatively short on liquid savings that could be used towards a home purchase.

Public policy interacts with these life cycle timing issues; there are tradeoffs between making life easier at one age versus another. Sometimes, this is clearly intended: for example, under Social Security, one remits payroll taxes to the government during prime earning years in order to receive benefits in retirement. However, sometimes this can happen in an unintended manner: a seemingly-age-neutral policy may affect different age groups in different ways.

Federal tax policy interacts with housing affordability through itemized deductions on Schedule A of Form 1040—particularly, the deductibility of property taxes and the deductibility of mortgage interest. While these itemized deductions are available to taxpayers of any age, they have a differential impact, on average, on the finances of taxpayers in different age groups.

While these deductions are intended to increase housing affordability and are a boon to current homeowners, they can have the perverse effect of increasing the price of existing homes, making it hard for young would-be-homeowners looking to buy for the first time. Theoretical models predict such an increase, especially in high-priced cities with relatively inelastic housing supplies. Furthermore, the curbing of the property tax and mortgage interest deductions in the 2017 Tax Cuts and Jobs Act (TCJA) slowed house price growth, consistent with those model predictions.

There is a strong family affordability case for avoiding policies that increase home prices. Even if mortgage interest deductibility and property tax deductibility do make housing less costly for many Americans over the course of the life cycle by reducing the after-tax cost of monthly mortgage and property tax payments, they also engorge home prices. This time structure for the expenses—a bigger up-front cost, followed by cheaper after-tax monthly payments—is not a favorable schedule for Americans under 45, who have plenty of earning years remaining but relatively fewer savings.

Evaluated through the lens of family affordability, this is a failure. People under 45 are responsible for 99.75% of births in the United States.[1] Their families are most likely to be growing, and they are most likely to need more space. If public policy is to have an effect on the timing of house payments, it should make that timing more favorable to people in the under-45 age bracket, not less. At a minimum, it should do no harm. Therefore, this report recommends the continued limitation of housing-related tax deductions, especially at the higher end of the market where they are most likely to be capitalized into higher home prices.

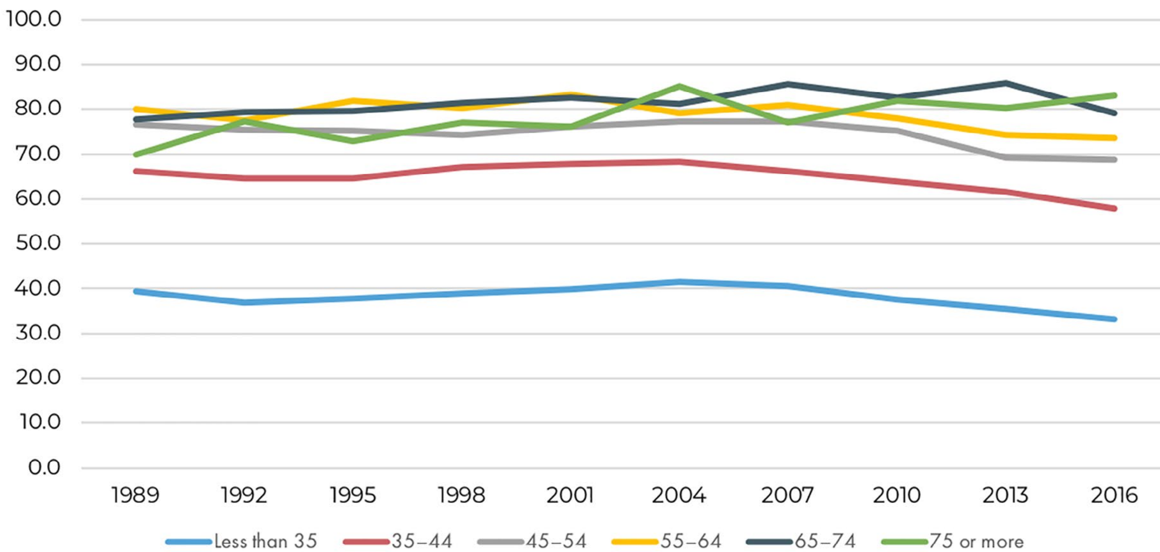
THE STATE OF HOMEOWNERSHIP BY AGE, 1989-2016

Homeownership provides some important benefits over the alternative of rental housing. Owner-occupied housing aligns the interests of owner and occupant, allowing for efficient decision-making and eliminating the tenant-landlord conflicts that can arise from renting. This eliminates some of the ongoing transaction costs of rental arrangements, where both renter and landlord may need to insure or self-insure against conflicts with a counterparty. Homeownership also confers some financial benefits that would not be available to renters; for example, rather than devoting a stream of taxable income to paying rent, owners receive a stream of in-kind income—the ability to live in the house—that goes untaxed. Finally, owner-occupied units also tend to provide a step up in quality: they are larger in relative terms than rental units and more customizable.

For young married couples looking to start a family, upsizing to an owner-occupied home is often an important and useful life milestone. However, a look at the last thirty years of data shows that younger Americans are less likely to be homeowners than they were in the past. The following analysis uses the Federal Reserve Board's Survey of Consumer Finances (SCF), a triennial survey with detailed data on household income and net worth between 1989 and 2016.

A comparison of homeownership between the oldest and most recent years of the survey shows that all age groups younger than 65 were less likely to own their primary residence in 2016 than people of the same age were in 1989. Most of this decline in homeownership came after the 2008-2009 housing crisis. Rather than recovering to pre-crisis norms, homeownership continued to decline for working-age households, all the way through the 2009-2020 expansion.

Trends in Homeownership by Head of Household Age



Source: Federal Reserve Board Survey of Consumer Finances, Table 9, https://www.federalreserve.gov/econres/scfindex.htm

The declines in ownership among those less than 35 years old and ages 35-44 should be a particular cause for concern. While their low ownership rate could be a personal choice, many younger people aspire to own and see it as a prerequisite for key life steps such as marriage or parenthood.[2] While most people do eventually achieve homeownership later in life, it often comes substantially later than marriage or parenthood—and later than similar families would have owned in 1989.

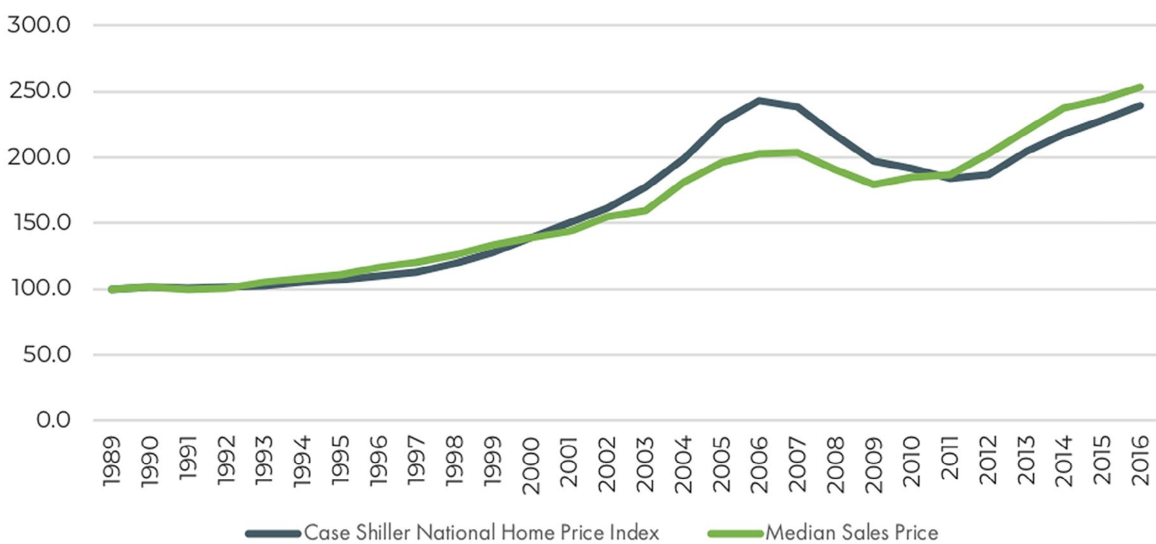
THE STATE OF HOUSING AFFORDABILITY FOR YOUNG FAMILIES, 1989-2016

The most obvious barrier to homeownership is cost. The purchase can typically be divided into two categories of expense: the up-front expense of the down payment and the recurring expenses of debt service and property taxes. Up-front expenses are paid with accumulated wealth, and the recurring expenses are paid with future income. While families have some flexibility in theory to shift expenses between these two categories (for example, by lowering or increasing the percentage of money down) there are limits to this flexibility. Most first-time homeowners can only afford a small down payment, but lenders may require mortgage insurance or increase the interest rate for buyers who put less money down.

Two major long-run trends have affected housing affordability since 1989: an increase in home prices and a decrease in long-term interest rates. The former trend has made down payments more difficult, but the latter trend has made it easier to finance the remainder of the principal through recurring payments.

From 1989 to 2016, the price of homes more than doubled. The median new residential sale was $305,125 in 2016, up from $120,425 in 1989.[3] This was a fast increase in prices: 153 percent over 27 years. A more sophisticated method from economists Karl Case and Robert Shiller, known as repeat-sales indexing, tracks price changes found in multiple sales of the same home. It shows a smaller increase of 140 percent, suggesting that some of the increase in median home prices is attributable to improved quality.

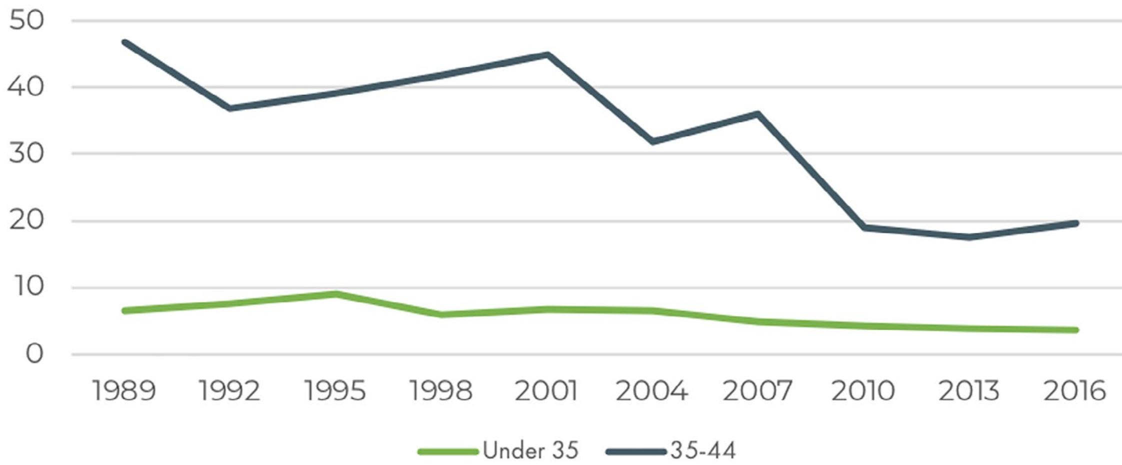
Housing Prices (Index, 1989=100)



Source: S&P/Case-Shiller U.S. National Home Price Index, retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CSUSHPINSA; U.S. Census Bureau and U.S. Department of Housing and Urban Development, Median Sales Price of Houses Sold for the United States, retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MSPUS

This rise in home prices has made it more difficult for young families to afford a down payment. The chart below shows median net worth for young households as a percentage of median home price—in other words, the percentage down payment they could afford if their net worth were typical and applied entirely to the purchase of a typical home. Net worth for a family with a household head under 35 was 6.5 percent of the median home price in 1989, but just 3.6 percent in 2016. For households whose head was between 35 and 44, that percentage fell from 46.8 percent to 19.6 percent over the same period.

Median Net Worth as a Percentage of Median Home Value, by Age of Household Head

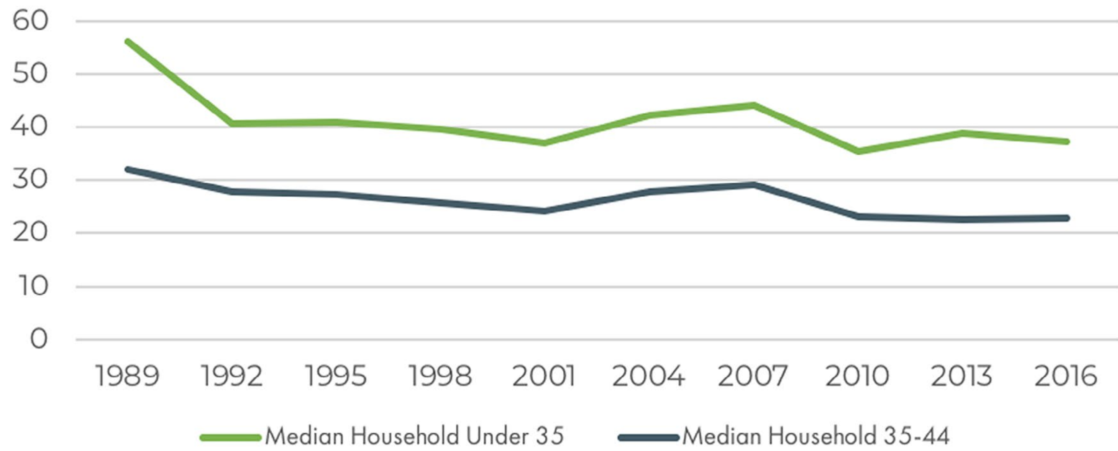


Source: Federal Reserve Board Survey of Consumer Finances, Table 4, https://www.federalreserve.gov/econres/scfindex.htm; U.S. Census Bureau and U.S. Department of Housing and Urban Development, Median Sales Price of Houses Sold for the United States [MSPUS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MSPUS.

The declining ratio of net worth to home value is matched by the trend in actual down payments for first-time buyers as reported by the National Association of Realtor's Profile of Home Buyers and Sellers (HBS). The median first-time buyer made a 10 percent down payment in 1989, but just 6 percent in 2016.[4] In other words, buyers are financing a greater portion of their home purchases.[5]

On this front, there is much better news: despite the increase in home prices, monthly mortgage payments have become more affordable. This affordability is driven by rising incomes and falling interest rates. In 2016 the average 30-year fixed mortgage was 3.65 percent, down from 10.32 percent in 1989.[6] The 153 percent rise in average home prices corresponds to just a 29 percent increase in the nominal monthly payment on a 30-year fixed mortgage after the drop in interest rates is taken into account. As nominal incomes have risen by considerably more than this, the debt service payment has become more affordable.

Debt Service Payment on a Median Home as a Percentage of Household Income



Note: Assumes a 90 percent LTV ratio and a 30-year fixed mortgage at average rates

Sources: U.S. Census Bureau and U.S. Department of Housing and Urban Development, Median Sales Price of Houses Sold for the United States [MSPUS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MSPUS, April 1, 2020. Federal Home Loan Mortgage Corporation, 30-Year Fixed Rate Mortgage Average in the United States [MORTGAGE30US], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MORTGAGE30US, April 1, 2020. Federal Reserve Board Survey of Consumer Finances, Table 1, https://www.federalreserve.gov/econres/scfindex.htm. Author's Calculations.

These measures of housing affordability ultimately yield some mixed conclusions on affordability. Today's under-45 workers have more skills and more expected future income than has any generation that came before. But future opportunities are not "cash in the bank" unless leveraged into a mortgage, and high leverage comes with risks and drawbacks.

In the Joint Economic Committee report *The Wealth of Relations*, one factor discussed in declining family formation is increased educational attainment. Education is a deeply worthwhile end in itself and often instrumentally useful for increasing labor productivity. However, it also creates tradeoffs and challenges that did not exist in the past.[7] Education takes time and effort; forgoing work opportunities in exchange for schooling can make it hard to build financial wealth early in one's career, even if it is extremely beneficial later on.

Another trend that makes this comparison more complex is household size, which has declined since 1989. Americans are marrying later. This mechanically reduces wealth per household by reducing the number of adults per household. The relationship can be causal in both directions—marriages help build wealth and economies of scale in housing, but wealth-building is often seen as a prerequisite for marriage.

This analysis has a few limitations. It uses a simple nationwide median home price, which obscures some details of interest. Median home quality has likely risen, as implied by the Case-Shiller index; square footage has also risen.[8] Attempting to hold housing quality constant by using the Case-Shiller index would show 2016 to be slightly more affordable than is suggested in the above analysis of the median.

Housing market conditions are also quite diverse across geography. Some areas are cheap even as nationwide house prices have risen; others are expensive even if the purchase is financed at low rates.

Finally, median is not an ideal measure for cost to young families; younger households who are often first-time buyers are likely to face lower prices for older, smaller homes. The median home price was $257,000 in 2019, but it was just $215,000 for first-time buyers.[9] The typical home purchased by a first-time buyer was 1,620 square feet, versus 1,850 square feet among homebuyers generally.[10] While the analyses in this section are based on new single-family homes, new homes as a whole constituted just 14 percent of home sales in 2016, down from 29 percent in 1989.[11] The median purchase price of new homes in 2019 was $329,750, while it was just $245,000 for previously owned homes.[12]

The overall question of whether homes have become more or less affordable to the average young American household is a difficult one that hinges on how the terms are defined. However, there is strong circumstantial evidence that down payments, not monthly payments, are the greater financial challenge for first-time homebuyers.

THE INTERACTION BETWEEN FEDERAL TAXES AND HOME PRICES

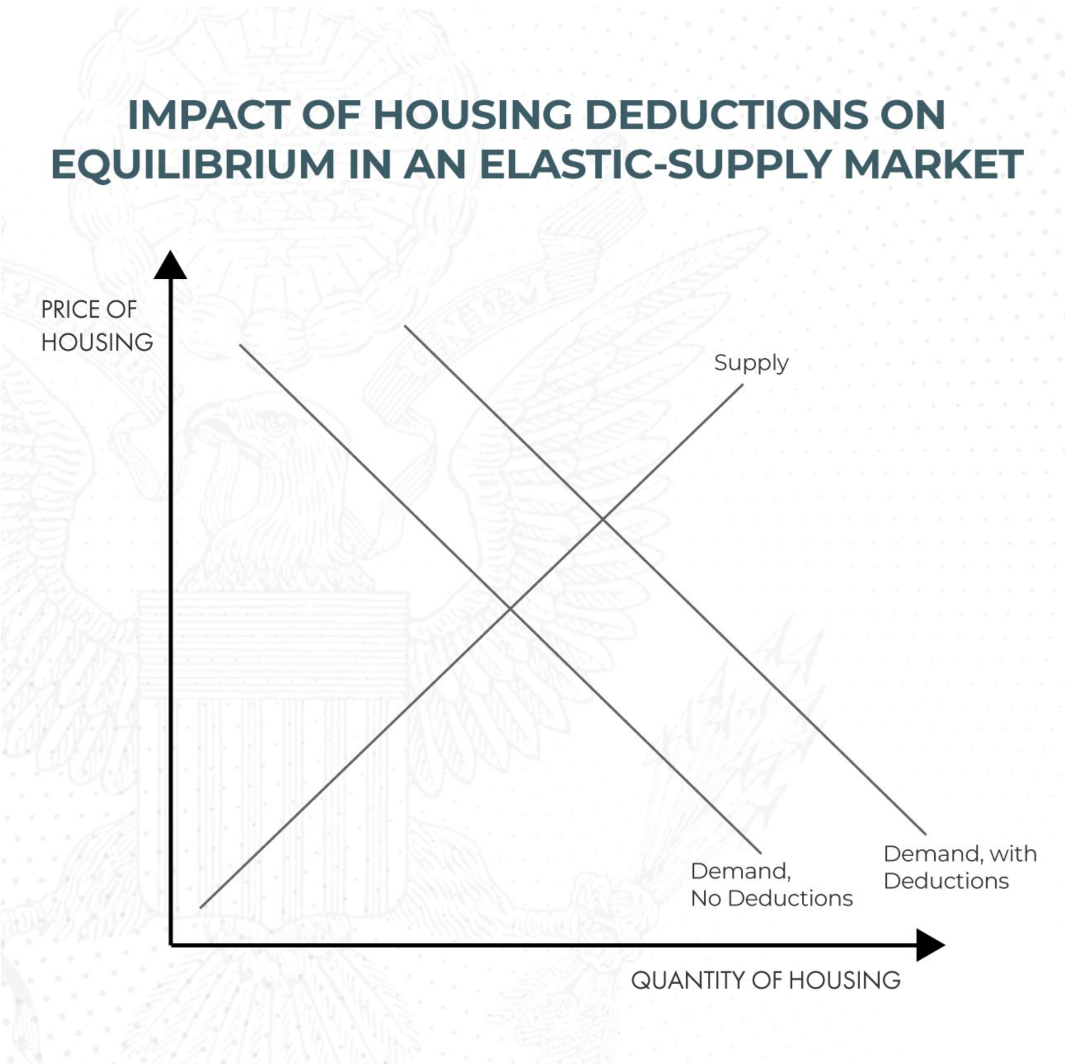
The federal income tax code includes two deductions that interact with housing: the deductibility of mortgage interest and the deductibility of residential property taxes. The latter is part of a broader policy of limited deductibility of state and local taxes.

The mortgage interest deduction allows taxpayers to deduct the portion of housing debt service payments attributable to interest, not principal repayment. Its value only applies to the interest on the first $750,000 of principal of a home. For example, someone who had $1.5 million in debt would be able to count only half of the interest paid towards the mortgage interest deduction. The state and local tax deduction allows taxpayers to deduct up to $10,000, combined, of all state and local taxes, including residential property taxes.

These two deductions both pertain to the ongoing expenses of housing; they are both tied to periodic payments associated with homeownership, not with the initial purchase price. They can soften the monthly payments, effectively reducing those payments by the marginal tax rate to which the deduction applies. By contrast, these deductions do not help with the down payment. Their first-order effect is to help with the easier part of paying for a home, not the harder part.

It is also useful to consider second-order effects. The second-order effect is that people become willing to pay more for homes, knowing that the tax benefits on monthly payments are available. A more formal model of this behavior is available in the Appendix, but it can be understood relatively simply: a home that comes with some associated tax deductions is surely more valuable to its owner than the same home in the absence of the deductions.

Finally, one can consider third-order effects; how does the housing market respond to the increased demand from buyers? This could—in theory—increase the supply of housing by drawing more housing into production. In the ideal case, the policy would have an effect similar to the one pictured below:

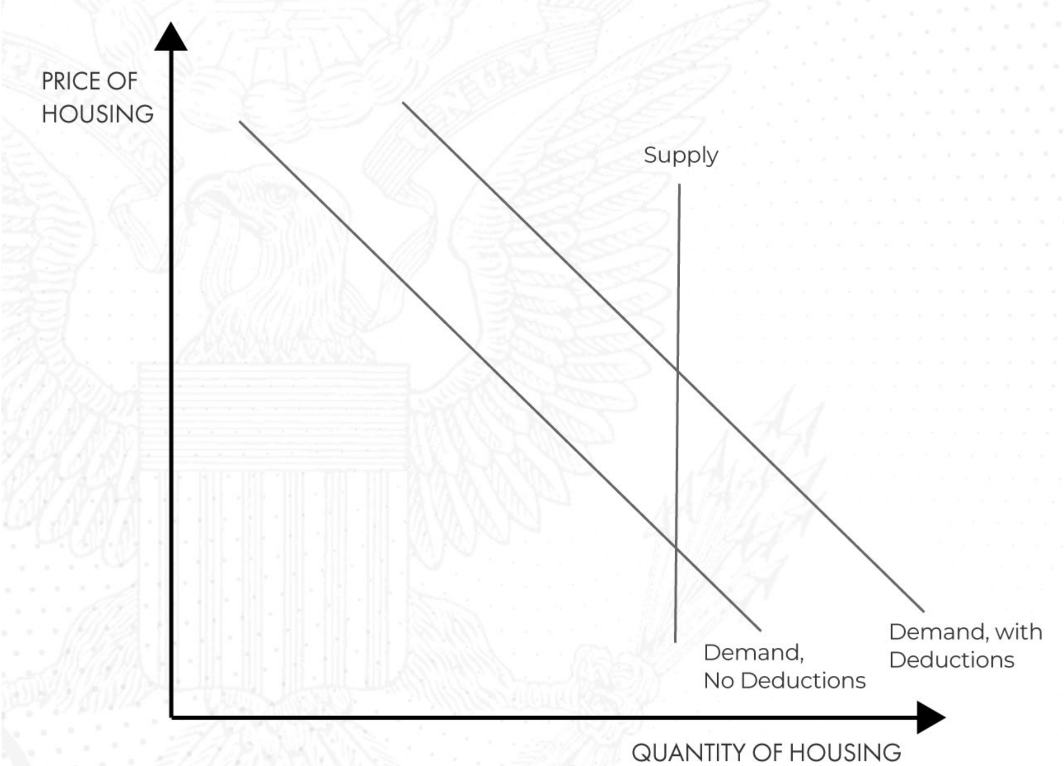


In this example, houses are more desirable with tax deductions, and users' willingness to pay is increased. This willingness to pay flows through to the housebuilding industry, making it more profitable. The housebuilding industry responds by increasing quantity supplied. Under these circumstances, the policy potentially achieves the goal of supplying more housing—particularly, owner-occupied housing.

Even in this best case, there are caveats; home prices still rise somewhat, potentially making down payments more difficult for first-time buyers. Additionally, "quantity of housing" could expand by offering larger homes to the people who can already afford homes, not by increasing total home quantity.

Moreover, this best case—as our label for it suggests—is not the only possibility. Consider a city in which all homes are already built, and construction of new residential dwellings is effectively prohibited through zoning or other laws. In this case, supply is inelastic. By definition, it is impossible to expand housing supply.

IMPACT OF HOUSING DEDUCTIONS ON EQUILIBRIUM IN AN INELASTIC-SUPPLY MARKET



In such a market, tax deductions increase the willingness to pay, just as they did before, but the benefit becomes embedded entirely in the price of the home, and no new construction happens. In this case, the economic incidence of the deduction is entirely on the incumbent homeowner. The homeowner can, of course, sell the home—and the right to the associated tax deductions—to another person, but he or she will be able to charge extra for that privilege.

Under this specific circumstance, the housing tax deductions fail—and fail spectacularly—at making housing more available or affordable for families. An obvious way to demonstrate this is to note that there are no new homes; by definition, housing has not become more available.

It is also not more affordable; every dollar of the deductions is capitalized into the value of the home. This makes the down payment—the difficult hurdle for young families, even in median neighborhoods—more expensive than it would be otherwise. The affects aren't entirely bad. If potential homebuyers succeed at getting together the down payment, they benefit some from tax deductions on the back end; but those tax deductions are a privilege they paid for in the purchase price of the home, and the net benefit to a new homebuyer is zero.[13]

Some parts of the United States are closer to the first model, and new housing is built regularly. Other parts of the United States are closer to the second model, and new housing construction is mostly impossible because of zoning regulations. In general, increases in rules and restriction on land use tend to be associated with higher housing prices.[14] In a few metropolitan areas, such as San Jose, this is particularly acute.

The hallmark of a high-demand inelastic-supply area is extraordinarily high housing prices—ones that greatly exceed the cost of construction. High prices suggest that it would be profitable to bring more supply online, if it were possible to do so. Enduring high prices suggest that there are significant barriers to bringing new supply into the market.

To sum up the positive predictions from this analysis so far: there is good reason, in economic theory, to expect that itemized tax deductions raise the price of houses and do so particularly in expensive areas with an inelastic housing supply, such as San Jose. Removing or limiting these tax deductions, by contrast, would lower the price of houses, or at least slow their growth.[15]

THE EMPIRICAL RELATIONSHIP BETWEEN TAXES AND HOME PRICES

Some of the best-known empirical work on the relationship between mortgage interest deductibility and the housing market comes from a National Bureau of Economic Research (NBER) study of a major Danish tax reform in the 1980s, which curbed mortgage interest deductibility. The study found that the limitation on mortgage deductibility had no effect on the quantity of homeownership, but it did cause people to scale back square footage, and it reduced home prices. The effect on prices was larger than the effect on square footage.[16]

The results of this study suggest that mortgage interest deductibility does not help more people become homeowners, but that it does engorge the price of homes generally and finance the construction of larger homes than would have otherwise been constructed. These empirical results are consistent with the theoretical models described previously.

The United States recently passed a tax reform bill which can once again test the hypothesis. The tax reform passed by Congress in 2017 limited itemized deductions, changing the tax treatment of housing in ways not dissimilar from the Danish reform described above. This 2017 tax reform, the Tax Cuts and Jobs Act (TCJA), made three important changes to the tax code that affected housing:

- It limited the mortgage interest deduction to apply only to the first $750,000 of principal, rather than the prior limit of $1,000,000. This means that on any loan whose outstanding principal is greater than $750,000, an additional marginal dollar of borrowing does not result in an increase in mortgage interest deduction allowed;
- It limited deductibility of state and local taxes to the first $10,000. This means that for any taxpayer who would already reach this limit, home value at the margin does not trigger any new property tax deductibility;
- It nearly doubled the standard deduction. For example, for married couples, the standard deduction rose from $13,000 to $24,000.

The last change requires some explanation. While the first two changes are explicit reductions in housing-related tax deductions, the last change is an implicit one. The first two deductions are known as “itemized deductions” in the federal tax code. The standard deduction is an alternative to itemized deductions; taxpayers must pick one or the other. In an economist’s language, the standard deduction is the opportunity cost of taking itemized deductions. Itemized deductions are only valuable insofar as they exceed the value of the next best alternative, so the increase in the standard deduction reduced the share of taxpayers who itemized, and it also made itemization less valuable in relative terms for those who still did itemize.

It is also worth noting that these changes, collectively, applied substantially more to expensive houses in high-income areas. Most taxpayers, even prior to TCJA, chose the standard deduction rather than itemized deductions; they got no value out of the deductions that were curbed.

Furthermore, the explicit caps on these deductions were high. The limit on mortgage interest deductibility, for example, applies to houses more than twice the national median price. The limit on state and local tax deductibility also applies only to the kind of high-income household that would have at least $10,000 in state and local taxes—a far above-average tax burden.

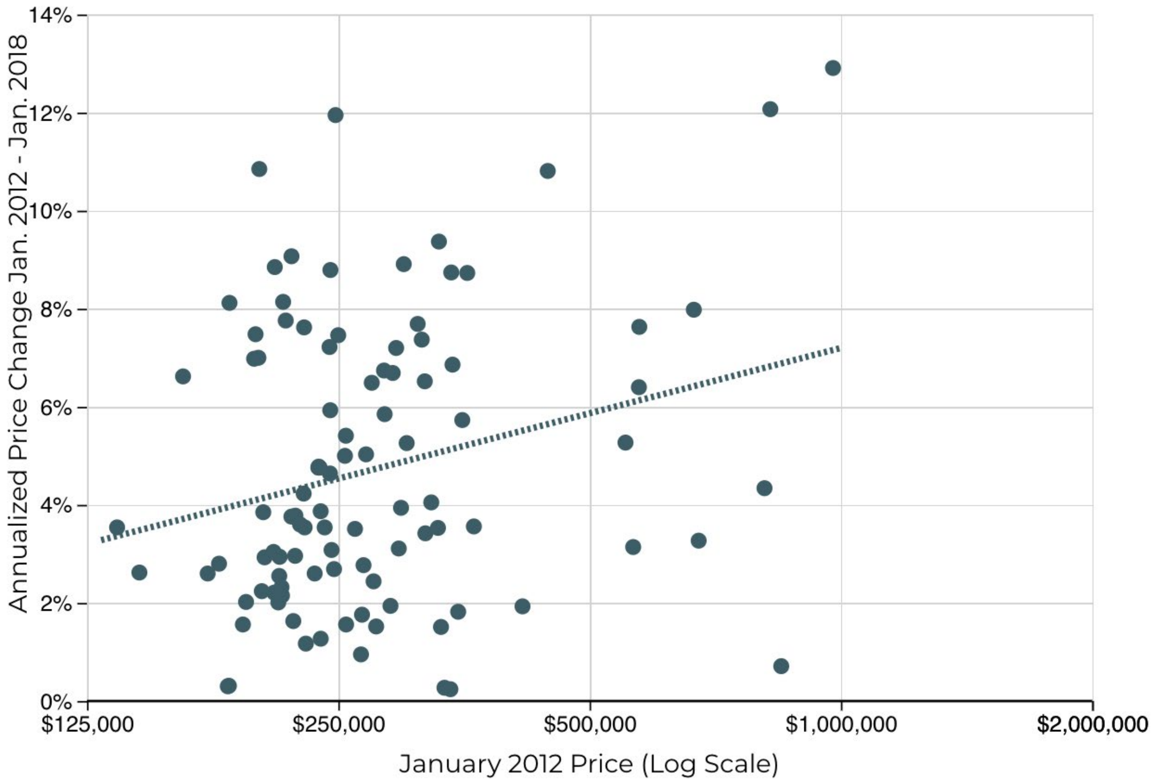
Coupling these facts about TCJA's policy provisions with the typical models of housing prices, or the empirical results from Denmark, we can make testable, empirical predictions about what the consequences of the law would be. The TCJA should reduce home prices in areas with expensive housing—or at least cause them to grow more slowly than they would otherwise.

These empirical predictions, so far, have been borne out by the reality. The state of housing across the United States—especially at the high end of the scale, where TCJA's changes are most relevant—has changed substantially since the bill was passed.

The analysis below focuses on high-priced homes, not because their affordability matters more than low-priced homes, nor because young families would be expected to buy them as starter homes. Rather, the high end of the housing market is the focus, first, because that was the price range to which TCJA's provisions most strongly applied, and therefore, the range for which TCJA is an interesting experiment. Second, a focus on the high end shows how deeply unmoored the mortgage interest deduction's actual effects were from anything resembling greater "affordability." While the deduction was ostensibly a universal policy to help with homeownership, an extraordinary portion of its value was capitalized into expensive lots in exclusive neighborhoods.

The best way to see how TCJA changed the housing market is to look at the trends that were in place prior to its enactment. Home prices had begun to recover from the 2007-2009 crisis around the beginning of 2012. From that point until the end of 2017, the prices of all homes grew—but the prices of high-quality homes in high-cost areas grew faster than average. There was a divergence, or a widening of the spread in house prices.

Annualized Price Growth for Zillow Top Tier Homes by Metro Area, Jan 2012-Jan 2018



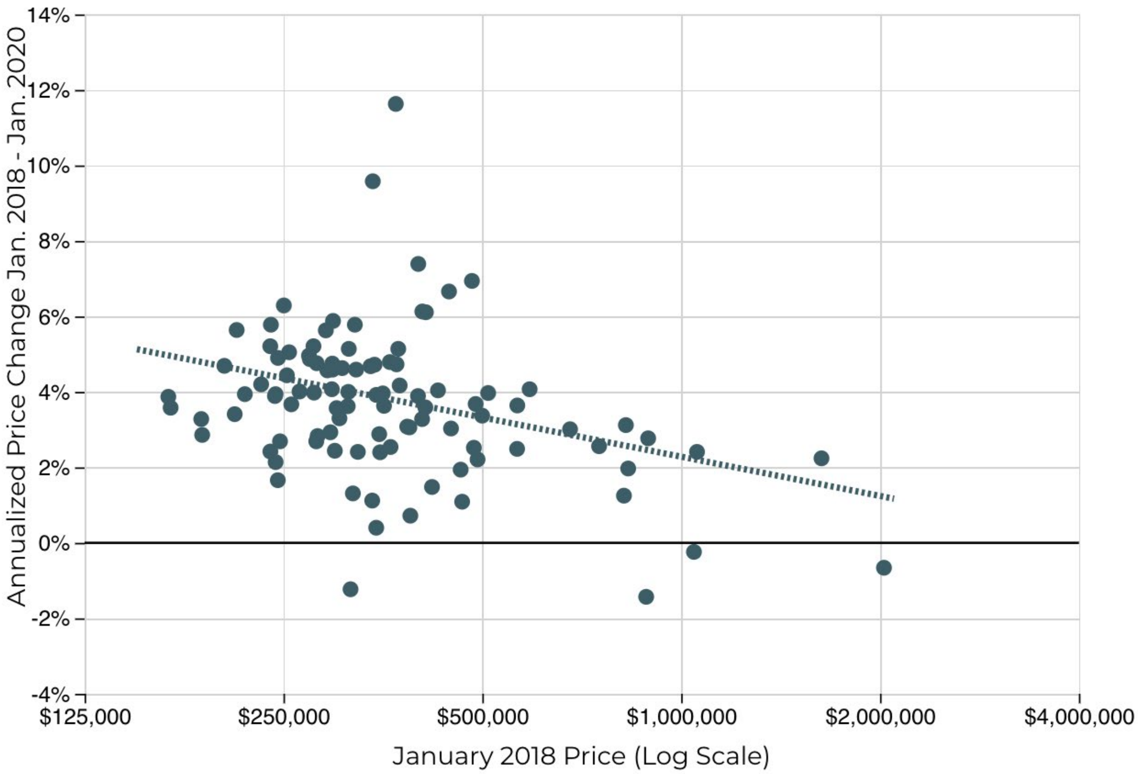
Source: Zillow ZHVI Top Tier Time Series, https://www.zillow.com/research/data/

The data for this chart come from the Zillow Home Value Top Tier time series, which looks specifically at homes in the 65th to 95th percentile for their metropolitan area. The data for the pre-TCJA housing recovery show that high-priced metropolitan areas (MSAs) had somewhat faster price growth than the rest of the country. The most exceptional data points are San Jose and San Francisco, which were already first- and third-most expensive even at the beginning of the recovery, and then first and second in growth for the next six years. Even without these exceptional cities, though, there was still a modest trend of home values in expensive areas outpacing those in less-expensive areas.

While these fast-rising prices were good news for incumbent homeowners, they were bad news for would-be buyers; particularly, for young people with good future prospects but not nearly enough liquid wealth to pay exorbitant prices.

At the end of this period, TCJA was signed. From 2018 to 2020, the trend reversed itself entirely. Low-cost areas began to catch up.

Annualized Price Growth for Zillow Top Tier Homes by Metro Area, Jan 2018-Jan 2020



Source: Zillow, Author's Calculations

After TCJA, the entire character of the U.S. housing market changed. Formerly-unstoppable markets at the high end slowed, and moderate-priced cities like Boise and Salt Lake City began to shine.

These outcomes strongly suggest the theories about the incidence of the tax deductions were right: in high-cost low-elasticity markets where the deductions were most relevant, they were capitalized into the values of the homes. Removing the deductions appears to have—at least temporarily—slowed the frenetic house price growth in these places.

The evidence from TCJA so far suggests that housing-related tax deductions were counterproductive prior to 2017. Imagined at their best, these deductions would have made the monthly payments on a humble four-bedroom home more affordable for a couple of 33-year-olds with two children. However, in reality, much of the value of the deductions was capitalized into the values of million-dollar homes in the expensive neighborhoods of expensive cities, further driving up their prices. The actual effects of housing deductions—at least, the parts sensitive to TCJA's limitations—were contrary to the original vision.

Furthermore, the evidence from the higher-priced homes affected by TCJA is suggestive of what might happen if similar tax reform applied to lower-priced homes as well. It is possible that home prices would fall, making the owner-occupied market easier to break into.

POLICY IMPLICATIONS OF THE RELATIONSHIP BETWEEN TAXES AND HOUSE PRICES

The major policy implication of the analysis above is that the itemized tax deductions for housing—at least at the high end, as currently structured—are a failed policy. The first-order effect of these deductions is to improve owners' abilities to make recurring payments (which have grown relatively more affordable over time) but not down payments (which have grown relatively less affordable over time.) While improving home affordability is a laudable goal, these deductions may not be helping in the most effective way.

The second-order effect of these deductions is to raise people's willingness to pay for housing, increasing prices, enriching incumbent homeowners, and making it harder for liquidity-constrained new families to break into the market. These second-order effects are not particularly desirable, as they put an additional load on first-time homebuyers.

In a subset of markets—the elastic ones—a third-order effect exists: higher willingness to pay may help bring new housing supply online. If so, the deductions would improve housing quantity and quality in the United States, and therefore make it more affordable to raise a family. (Though even in these markets, some of the value of the benefit will likely be captured by existing homes, rather than be allocated to producing new ones.) However, in the inelastic markets with sky-high prices, further tax deductions are merely captured by wealthy incumbent homeowners.

The limitations on housing itemized deductions in TCJA were therefore a good policy choice. If a policy like the mortgage interest deduction is truly about increasing housing affordability, then high-dollar markets are not a fruitful target; they are already unaffordable, often from limited supply, and adding deductibility for a bit more interest is will not address those issues. The limits on these itemized deductions should be made permanent.[17]

Furthermore, mortgage interest deductibility could be limited further; for example, the Family Fairness and Opportunity Tax Reform proposal from Senator and Joint Economic Committee Chairman Mike Lee expanded the mortgage interest deduction's eligibility at the low end, but restricted it to a maximum of $300,000 in principal.[18]

These limitations are, of course, revenue-raising, and therefore at their strongest when used in balance with more successful family affordability measures that return those revenues back to families. For example, Senator Lee's proposal expands the Child Tax Credit and counts it against families' combined income and payroll tax liabilities. Indeed, any measure designed to give young families a break and build more wealth could be effective in helping them get over the down payment hurdle.

The federal tax code's current provisions to improve housing affordability have a mixed record at best. If they help housing affordability, they do so at the wrong time. Empty-nesters, whose children have grown and left the household, are wealthier than they have been in the past. However, younger adults hoping to start a family are not doing as well. Federal tax policy should perhaps account for this reality—or at least, not make it worse. The current slate of itemized deductions is ineffective in achieving the goal of family affordability, and the system is therefore ripe for reform.

Appendix: Formally Modeling the Relationship between Tax Deductions and Willingness to Pay

House deeds are a property right. The property right confers a consumption benefit—in that one can live in the house, and this is valuable—but these deeds also come with many costs and tie up money that could be invested elsewhere; absent the gains one gets from living in homes, they are relatively poor investments.

One way to analyze homeownership is to balance the benefits of living in the home against its relative weakness as a financial investment. The price of the home should rise or fall until the benefits of living in it perfectly offset the financial drag, or "user cost."

A "user cost" expression for a marginal dollar of housing in the United States can be expressed like this:[19]

$$UC=LTV(1-\tau)\, r\_m+(1-LTV)(1-\tau)\, r\_e+(1-\tau)b+(1-\tau)\tau\_p+\delta-\pi$$

Where UC is user cost per unit of purchase price, LTV is loan-to-value ratio, τ is the federal tax rate, r_m is the mortgage interest rate, r_e is the opportunity cost of equity, b is the risk premium on the real estate, τp is the property tax rate, δ is the economic depreciation on the home, and π is the expected rate of capital gains on the home.

This particular statement of the formula assumes that the user is able to take itemized deductions for that dollar of home price. Without the two itemized deductions, the terms where federal taxes interact with property taxes or mortgage interest disappear:

$$UC=LTVr\_m+(1-LTV)(1-\tau)\ r\_e+(1-\tau)b+\tau\_p+\delta-\pi$$

As both of the terms pertaining to itemized deductions are negative, the user cost per dollar of housing falls with these deductions—or rises without them. As stated above, in equilibrium the total user cost is roughly equal to the value of living in the home. This means that—according to this model, a home's deed becomes more valuable the more tax deductions it is associated with, and less valuable with fewer tax deductions. According to this model, at least, tax deductions should increase people's willingness to pay higher prices for the homes.

ENDNOTES

1. Martin, Joyce, Brady Hamilton, Michelle Osterman, and Anne Driscoll, *Births: Final Data for 2018*, National Vital Statistics Reports, Vol. 68 No. 13, November 27, 2019, https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_13-508.pdf.

2. Senator Mike Lee, *Making Housing Work for Utah Families*, June 7 2019, https://www.lee.senate.gov/public/index.cfm/2019/6/making-housing-work-for-utah-families.

3. U.S. Census Bureau and U.S. Department of Housing and Urban Development, Median Sales Price of Houses Sold for the United States [MSPUS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MSPUS, April 1, 2020.

4. National Association of Realtors, *2019 Profile of Home Buyers and Sellers*, January 2020, https://www.nysar.com/wp-content/uploads/2020/01/2019-NAR-HBS.pdf.

5. The limitations of this strategy were arguably discovered in 2005-2006, when the median down payment for first-time homebuyers reached an all-time low of 2 percent. Homes subsequently lost value, resulting in underwater mortgages and defaults. Markets have been understandably reluctant to repeat these results, and median down payment has since risen. It is also worth noting that the down payment percentages for repeat buyers have fallen as well; that is, they are also subject to the trend where paying off a home outright is relatively difficult, but paying the monthly mortgage has become easier thanks to low interest rates.

6. Freddie Mac, Primary Mortgage Market Survey, 30-Year Fixed Rate Mortgage Average in the United States [MORTGAGE30US], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MORTGAGE30U

7. Joint Economic Committee Social Capital Project, *The Wealth of Relations: Expanding Opportunity by Strengthening Families, Communities, and Civil Society*, Apr 30 2019, https://www.jec.senate.gov/public/index.cfm/republicans/analysis?ID=5A31D0C5-CE7C-45D9-8654-0A2358FCC33F.

8. While quality measurement can be difficult, square footage is more clear-cut. The median square footage on a new home has risen 32 percent, from 1,843 square feet in 1989 to 2,426 square feet in 2016. See: U.S. Census Bureau and U.S. Department of Housing and Urban Development, New Privately Owned Housing Completions in the United States, Median Square Feet of Floor Area for One-Family Units [COMPSFLAM1FQ], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/COMPSFLAM1FQ, April 1, 2020.

9. https://www.nysar.com/wp-content/uploads/2020/01/2019-NAR-HBS.pdf, Exhibit 2-17.

10. https://www.nysar.com/wp-content/uploads/2020/01/2019-NAR-HBS.pdf, Exhibit 2-19.

11. https://www.nysar.com/wp-content/uploads/2020/01/2019-NAR-HBS.pdf, Exhibit 2-1.

12. https://www.nysar.com/wp-content/uploads/2020/01/2019-NAR-HBS.pdf, Exhibit 2-16.

13. A reader may wonder where the benefit of the deductions went, if not to the person taking them. The answer is they are passed on in full to the previous owner.

14. Brown Calder, Vanessa, "Zoning, Land-Use Planning, and Housing Affordability", October 18, 2017, https://www.cato.org/sites/cato.org/files/pubs/pdf/pa-823.pdf.

15. While we derive this prediction independently in the paper, it has also been made recently by a variety of others in academia and business forecasting. See e.g. Rappoport, David, "Tax Reform, Homeownership Costs, and House Prices," Jan 14 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3308983. Or, for coverage of predictions by Moody's Analytics: Orton, Kathy and Aaron Gregg, "New tax law expected to slow rise of home values, creating winners and losers," *The Washington Post*, Dec 29 2017, https://www.washingtonpost.com/realestate/increasing-housing-prices-expected-to-slow-down-as-gop-tax-bill-begins-to-reshape-a-major-part-of-the-economy-analysts-say/2017/12/28/be3bc19a-e670-11e7-a65d-1ac0fd7f097e_story.html.

16. Gruber, Jonathan, Amalie Jensen, and Henrik Kleven, "Do People Respond to the Mortgage Interest Deduction? Quasi-Experimental Evidence from Denmark," NBER Working Paper 23600, July 2017, https://www.nber.org/papers/w23600.pdf.

17. Under current law, the individual income tax provisions of TCJA are set to expire after ten years.

18. Senator Mike Lee, "Family Fairness and Opportunity Tax Reform Act," Sep 17 2013, https://www.lee.senate.gov/public/index.cfm/2013/9/family-fairness-and-opportunity-tax-reform-act.

19. See: Hendershott, Patric and Joel Slemrod, "Taxes and the User Cost of Capital for Owner-Occupied Housing," July 1982, https://www.nber.org/papers/w0929.pdf.

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