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Metropolitan area home prices and the mortgage interest deduction: Estimates and simulations from policy change☆,☆☆

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ABSTRACT

We simulate changes to metropolitan area home prices from reforming the Mortgage Interest Deduction (MID). Price simulations are based on an extended user cost model that incorporates two dimensions of behavioral change in home buyers: sensitivity of borrowing and the propensity to use tax deductions. We simulate prices with both inelastic and elastic supply. Our results show a wide range of price effects across metropolitan areas and prospective policies. Considering behavioral change and no supply elasticity, eliminating the MID results in average home price declines as steep as 13.5% in Washington, D.C., and as small as 3.5% in Miami-Fort Lauderdale, FL. Converting the MID to a 15% refundable credit reduces prices by as much as 1.4% in San Jose, CA, San Francisco, CA, and Washington, D.C. and increases average price in other metropolitan areas by as much as 12.1% (Miami-Fort Lauderdale). Accounting for market elasticities produces price estimates that are on average 36% as large as standard estimates.

1. Introduction

Outstanding mortgage debt on one to four family residences peaked at over $11 trillion in 2008, and is currently $9.8 trillion (Federal Reserve Board of Governors, 2015). Depending on the year, taxpayers use between three and five percent of this debt in the form of the mortgage interest tax deduction (MID), to reduce their annual tax liability. The MID is effectively the largest housing-related subsidy in the United States with a price tag of over $100 billion/year during the housing market peak (currently $70 billion). Despite its seemingly small size relative to the mortgage market, the MID has a substantial distortionary impact on financing (Dunsky and Follain, 2000, 1997; Hendershott and Pryce, 2006; Poterba and Sinai, 2011), the size of dwelling choice (Hanson, 2012a), and the transition from renter to owner (Green and Vandell, 1999). Theoretical models and simulation also link the MID to suburbanization and sorting within cities (Voith and Gyourko, 2002) and to locational choice across metropolitan areas (Albouy and Hanson, 2014).

Less remarked on than behavioral distortions, but important for how the MID affects urban areas, is how it relates to home prices. Hilber and Turner (2014) offer empirical estimates suggesting that the current MID policy is capitalized into house prices more in highly regulated markets, with regulation being a determinant of supply elasticity. Of primary concern is how *changing* the MID might impact home prices. Home equity is a significant component of homeowner wealth, so significant changes to home prices would impact a household's current and future spending ability. Significant home price changes from any MID reform may also impact locational choice within and across metropolitan areas. Academic work on the price effects of reforming the MID is thin, estimates vary considerably, and most are based on pre-2008 housing market data.[1]

We produce up-to-date estimates of the home price effects for several MID policy alternatives with a modern user cost of housing model that includes behavioral change parameters. Our simulations cover home price effects in 34 metro areas for three different policy reforms: eliminating the MID, capping the MID, and converting it to a tax credit. Methodologically, we improve on the familiar user cost of housing

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[1] Capozza et al. (1996) estimate the impact of eliminating both the property tax deduction and the MID to be between 13 and 17% depending on behavioral change in loan to value ratios. More recently, Harris (2013) estimates the effect of several MID reform options and finds that eliminating the MID would result in an average price decline between 11 and 20%, with varying impacts across metropolitan areas.

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model by adding parameters that capture behavioral change when MID policy changes. Our behavioral change parameters are estimated using data across housing markets on the sensitivity of tax itemization rates and loan to value (LTV) ratios to the intensity of the MID. We estimate these relationships using state-level variation in MID policy with standard ordinary least squares (OLS) and instrumental variables (IV) regressions, using data from the Internal Revenue Service (IRS) and the American Housing Survey (AHS).

We add to the existing literature by incorporating local housing supply elasticities in our price simulations, and by comparing these with simulations that assume perfectly inelastic supply across markets. In each case our findings show that simulated price changes vary substantially across metropolitan areas, policy changes, and when we consider behavioral change. In inelastic supply models with behavioral change, eliminating the MID results in an average home price decline in Washington, D.C. of 13.5%, but only a 3.5% decline in Miami-Fort Lauderdale, FL. Converting the MID to a 15% refundable credit reduces prices by as much as 1.4% in San Jose, CA and increases average price in other metropolitan areas by as much as 12.1% (Miami-Fort Lauderdale). Estimates considering behavioral change in the itemization rate and LTV ratio result in price change estimates that differ by as much as 2.4 percentage points from the standard model. In models that incorporate elasticities from the empirical literature, price changes are substantially muted: for instance, considering local supply elasticity shrinks the price decline from eliminating the MID in Washington, D.C. from 13.5 to just 4.2%. On average simulations that use empirical elasticities to characterize local markets show price changes that are only 36% as large as the models that assume perfectly inelastic supply.

The paper proceeds as follows: Section 2 summarizes the user cost model that forms the basis for evaluating house price changes; Section 3 briefly describes the data used to calibrate the user cost model parameters and demonstrates the empirical estimation strategy for behavioral change parameters; Section 4 describes adjustments to the model to simulate tax policy and presents the results; Section 5 concludes.

2. Home prices and the user cost model

We model home prices and subsequent changes with a user cost model. This model treats housing as a capital asset and, properly specified, describes the opportunity cost of holding the asset in a given period.[2] The model implies that in a competitive equilibrium a homeowner's marginal cost of housing services is equal to the opportunity cost of homeownership, which is termed his imputed rent. For a simple, durable asset with no tax preference and a stable value, the imputed rent is straightforward: the opportunity cost of obtaining the good is the interest one would have earned with the money used to purchase the asset (or if the asset is debt financed, it is the explicit outlay of interest payments for the loan). Assuming the interest rate is the same in either case, one can write

$$R = Pr \tag{1}$$

where R is the imputed rent over a given period, P the purchase price and r the period interest rate. By rearranging terms, we can characterize the user cost of a unit of housing services, or UC:

$$UC = \frac{R}{P} = r. \tag{2}$$

Housing is, of course, neither entirely durable nor stable in value over time. The asset deteriorates, homeowners make repairs, and market conditions alter the expected future return from selling the asset. Also, local communities typically charge property tax. Adding these features to the model yields a user cost of:

$$UC = r + \tau_p + m + \delta - \pi \tag{3}$$

where m and δ reflect annual maintenance and depreciation costs respectively, π reflects the expected price appreciation rate, and τ_p is the local property tax rate.

The tax treatment of housing must also include the MID and property tax deductions.[3] For every dollar of mortgage interest (or property tax) paid, the homeowner reduces his taxable income by one dollar, and his tax burden falls by one dollar times his marginal tax rate (MTR), τ_{inc}. This rate of tax savings is called the marginal subsidy rate (MSR) of the MID. Considering this tax treatment, the user cost becomes:

$$UC = (1-\tau_{inc})(r+\tau_p) + m + \delta - \pi. \tag{4}$$

This is the characterization of user cost presented in Poterba (1992). Poterba and Sinai (2011) provide further revisions to the user cost model. They include: the flexibility for a homeowner to split financing between debt and equity; a distinct risk class for returns to homeownership; the benefit to homeowners from the option to prepay or default on their mortgage; and the flexibility for homeowners to characterize property taxes as either a benefit or an excise tax. The full model incorporating these features is given in Eq. (1) of Poterba and Sinai (2011),[4] and in our notation is:

$$UC = \left[1-\left\{\tau_{inc}*\lambda+\tau_y*(1-\lambda)\right\}\right]*\ r_T + \left(1-\ \tau_y\right)*\beta-\tau_{inc}*\lambda \\ *(r_M - r_T) + m + \delta + (1-\tau_{inc}-\kappa)*\tau_p - \pi \tag{5}$$

where λ is the percent of the home value financed through debt (i.e. the LTV ratio), τ_y is the income tax rate on capital gains, r_T is the risk-free rate of return in the market, r_M is the mortgage interest rate, β is the risk premium associated with homeownership and κ signifies the degree to which homeowners perceive the property tax to be a benefit tax (versus an excise tax).[5]

In order to operationalize the model to simulate a city's housing market using aggregated data, we modify it as follows:

$$UC_k = I(g)_k * UC_{Itemize,k} + \left(1-I(g)_k\right) * UC_{Standard,k.} \tag{6}$$

This is the weighted average user cost across market k of households that itemize deductions (and face $UC_{Itemize}$) and those that take the standard deduction (and face $UC_{Standard}$). $I(g)_k$ is the portion of tax filers who itemize their deductions in market k. It depends on the marginal subsidy rate g; empirically, as the MSR increases , more tax filers are inclined to itemize their returns.

We make several other changes to the user cost model in order to make it sufficiently flexible to simulate the price effects of changing tax policy. First, we posit that LTV ratios are sensitive to the deductibility of mortgage interest.[6] The model expresses $\lambda(g)_k$, the LTV ratio, as a function of the MSR in market k. We also separate the marginal tax rate that applies to deductibility, τ_{inc}, into deductibility applying to the

[2] An early discussion of this model appears in Poterba (1984).

[3] These deductions are claimed by itemizing on an income tax return. We examine the propensity to itemize and become eligible for these deductions explicitly in the model. Some states allow these deductions on state tax returns, a fact we exploit in the identification of behavioral parameters.

[4] Eq. (1) of Poterba and Sinai (2011) does not include the parameter κ, but it is introduced further into their paper. We also denote maintenance and depreciation separately to be consistent with earlier forms.

[5] Simulations in Poterba and Sinai (2011) are conducted for values of $\kappa=0$ and $\kappa=1$. Martin (2015) estimates this parameter to be 0.23, which is the value we adopt in our simulations. Sensitivity analysis is conducted for the cases $\kappa=0$ and $\kappa=1$ and the results are reported in Table 9.

[6] Previous literature describes the effect of the MID on LTV ratios: see for examples Dunsky and Follain (2000); Hendershott and Pryce (2006), and Poterba and Sinai (2011).