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On the user cost and homeownership

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Abstract

This paper studies the differences in the cost of housing services for renters and homeowners and calculates the bias that results when we value owner-occupied housing services using a rental equivalence approach. Our framework is a life-cycle model with endogenous tenure choice with households facing idiosyncratic uninsurable earnings risk and housing price risk. We model houses as illiquid assets that provide collateral for loans. To analyze the impact of preferential housing taxation on the tenure choice and the bias, we consider a tax system that mimics that of the US economy. Namely, owner-occupied housing services are not taxed and mortgage interest payments are deductible. Through simulations, we show that a rental equivalence approach (relative to a user cost approach) overestimates the cost of housing services. The magnitude of the bias is very sensitive to both the income tax rate and the size of adjustment costs in the housing market.
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1. Introduction

Housing services are an important component of aggregate consumption expenditure. In the 2006 National Income and Product Accounts (NIPA), housing services represent approximately 15 percent of aggregate consumption expenditures. A significant fraction of these services (about 80 percent) is acquired through homeownership (the remainder is obtained in the rental market). Therefore, it is important to pay attention to the valuation of owner-occupied housing services. The current practice by the Bureau of Labor Statistics is to use a *rental equivalence method* (see Verbrugge, 2003 and Poole et al., 2005 for a detailed description of this approach). Simply put, the Consumer Price Index is constructed assuming that the value of the services yielded by owner-occupied housing is the rental market value for the home. This approach is also used in constructing NIPA. As Prescott (1997) argues, this procedure is inconsistent with the principle that the effective price of a commodity should be its cost to the household consuming it (a *user cost method*). In the absence of frictions, both procedures—by asset pricing theory—should yield the same value for owner-occupied housing services. However, there are important frictions in the housing market. First, owner-occupied

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housing services are not taxed (whereas rents of leased homes are) and interest mortgage payments are tax deductible. Second, houses are illiquid assets that also serve as collateral for loans. These frictions create a wedge between the user cost of owner-occupied housing services and the market rental price.

The purpose of this paper is to understand the differences between the user cost and the rental price for housing, and to give an estimate of the bias resulting from valuing owner-occupied housing services using the rental price. To this end, we start by constructing a model that mimics some key features of the US economy. Our model is a partial equilibrium life-cycle economy where households face uninsurable idiosyncratic labor risk and house price uncertainty. Households obtain utility from the consumption of nondurables and housing services. They can save either in the form of liquid financial assets or houses, which are subject to transaction costs. Houses can be financed minus a down payment and also serve as collateral for home equity loans. For simplicity, the only source of credit is collateralized loans on housing. We mimic the US tax system in a stylized way by assuming that houses are given preferential tax treatment: mortgage interest payments are deductible and services from owner-occupied housing are not taxed.[1] Moreover, we assume that households are subject to idiosyncratic moving shocks that force them to sell their housing stock. This shock is meant to capture, in a stylized way, the effect of geographical mobility or changing needs due to variations in family size.

In our model and in reality, the housing tenure choice depends on several factors. On the one hand, buying a house insulates the consumption of housing services from variation in the rental price of housing. On the other hand, houses are illiquid assets and, hence, a very poor vehicle for shielding nondurable consumption against transitory income risk. Furthermore, homeowners' wealth is exposed to housing price risk whereas renters' wealth is not. Importantly, houses serve as collateral for loans but typically cannot be fully financed. In terms of taxation, owner-occupied housing services are not taxed and mortgage interest payments are deductible from the income tax base. Given this preferential tax treatment, households that are unlikely to move prefer buying to renting while younger households typically opt for renting because they must either accumulate a down payment or are more likely to move.

We construct a measure to price owner-occupied housing services, an ex post user cost based on the shadow price of housing for homeowners, which is the realized cost per dollar invested in housing stock. It is simply the present value of the sum of maintenance costs and property taxes (net of deductions), current and future transactions costs (appropriately discounted), the forgone return to home equity, and the cost of the mortgage (net of possible deductions) minus capital gains. Our user cost definition is different from that used by Poterba (1984) and Himmelberg et al. (2005) in two respects: (1) we include transaction costs and (2) we differentiate the cost of a dollar from own wealth invested in housing (given by the return to the alternative asset), and the cost of a borrowed dollar (the mortgage interest rate net of income tax deductions). Thus, user costs may vary across households because of differences in mortgage loan-to-value ratios as well as differences in the time of house purchase.

The user cost differs from the rental price of housing for a number of reasons. Most importantly, rental income from housing is taxable and its tax burden is internalized in the rental price, whereas services from owner-occupied housing are not. Even if the latter were taxed, the user cost and the rental price would be different. First, the existence of transaction costs implies that the user cost varies across households depending on the frequency of transactions. Second, the existence of spread in interest rates and the tax deductability of mortgage interest payments open a wedge between the forgone return to home equity and the cost of the mortgage. This implies that the user cost varies by household with mortgage loan-to-value ratios. Also, the divergence between the user cost and the rental price is further magnified when the present value of capital gains is included in the definition of user cost.

Through simulations, we calculate the bias resulting from valuing owner-occupied housing services using the rental price as opposed to the user cost. In our benchmark calibration, the bias is substantial: when using a rental equivalence approach we overestimate the cost of housing services by approximately 10.9 percent. Using our model, we are able to assess the quantitative importance of each component of our measure of the user cost. For instance, we find that the bias is very sensitive to the income tax rate. When we reduce the tax rate from 20 percent (our benchmark calibration value) to 15 percent, the bias goes down to 6.5 percent. Other important determinants of the bias are the magnitude of transaction costs (the higher the costs the lower the bias) and the existence of spread between the interest rate paid on mortgages and the interest rate on savings. With a 1 percent spread between both interest rates, the bias reaches the lowest of all scenarios considered, 2 percent. Importantly, we identify the tax exemption of owner-occupied housing

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[1] The preferential tax treatment on housing has been analyzed elsewhere. See, for example, Poterba (1984), Gahvari (1984), Skinner (1996) or Gervais (2002).

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