Proposal for 2012 Russell Ackoff Doctoral Student Fellowship

Estimating the Price Elasticity of Demand for Housing Services Using GSE Private Mortgage Insurance Requirements

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Research Question:
The purpose of this research will be to provide novel and credible estimates of the price elasticity of demand for housing services. This elasticity is a crucial parameter in determining the extent to which changes in the user cost of housing such as the interest rate, the capital gains exclusion, and the mortgage interest and property tax deduction translate into changes in housing consumption (Poterba 1984; Himmelberg, Mayer and Sinai, 2005; Poterba and Sinai, 2008; Glaeser et al. 2012). It is also central in calculating the excess burden of the implicit subsidy to owner occupied housing (Rosen, 1979, 1985; Poterba, 1992).

Previous Literature:
Prior research has attempted to estimate various versions of the user cost elasticity; however recent estimates are hard to come by (Hanushek and Quigley 1980; Rosen 1979, 1985). With the exception of Hanushek and Quigley (1980), who provide quasi-experimental estimates for a small sample of renters in the Phoenix and Pittsburgh metropolitan areas, these estimates tend to be based on econometric procedures that are likely to generate substantial bias. This project will employ a more credible empirical methodology to provide a much-needed update to the previous estimates.

Research Design:
In order to estimate the price elasticity of demand for housing services, one cannot just look in the cross-section to see how housing expenditures vary with standard components of the user cost formula such as mortgage interest rates, property tax rates, or housing prices. These variables are jointly determined with housing demand, causing empirical methods based on simple correlations to produce biased estimates.

To get around this issue, I will make use of a regulatory requirement imposed on the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac that generates a large kink in the household budget constraint. The GSE charters require credit enhancement on any mortgages purchased by Fannie Mae and Freddie Mac with loan-to-value (LTV) ratios in excess of 80%. Because of this, lenders typically require borrowers with LTVs greater than 80% to acquire private mortgage insurance (PMI). Since PMI is priced as a function of the value of the house and the LTV, this requirement raises the per-unit cost of housing services thereby generating a kink in the budget constraint for housing and numeraire consumption.

A recent literature in public economics has explored the consequences of kinked budget constraints for household behavior as well as developed econometric methods for estimating elasticities using these kink points (Friedberg 2000; Blundell and Hoynes, 2004; Saez, 2010; Chetty et al., 2011). Intuitively, the excess mass of households who locate at the kink point can be used in combination with the size of the kink to back out income compensated price elasticities of demand. Applications of these methods have been limited thus far to Federal income taxes, Social Security benefits, and retirement age decisions. This project would be the first application to the housing market.

Data
The primary data source for this project will come DataQuick, a real estate information company. These data provide me with transaction level information on the universe of residential real estate purchases in over 90 Metropolitan Statistical Areas (MSAs) going back in some cases as far as 1987. Importantly, these data contain information on both the transaction
price and the loan amounts on up to three mortgages taken out at the time of transaction. Using this information I can construct the full distribution of loan-to-value ratios at any level of geographic or temporal aggregation. I have also matched the DataQuick data with loan application data reported through the Home Mortgage Disclosure Act (HMDA). This provides me with further information on mortgage and borrower characteristics such as loan purpose, loan type and borrower race and income.

I have not yet acquired data on the price of private mortgage insurance, which will be a crucial input in the calculation of demand elasticities. This data is available for purchase through private mortgage insurers and would be, along with travel funds, the primary use for the Ackoff funds.

References:


