

Housing Demand

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Housing stock and the associated housing services often constitute families' biggest out-of-pocket spending expenses and housing bundles often constitute their biggest and only savings instruments. Further, housing defines neighborhood quantity and quality, and is often characterized in terms of desirable social outcomes.

This entry concentrates on individual housing demand. It starts with a brief history, and the background of the literature that led into the early 1970s at which time modern housing demand analysis emerged. The following section looks at housing applications of demand theory, and the subsequent analysis looks at what is distinctive about housing.

Policy issues include the owner/renter choice, as well as governments' roles in promoting home-ownership. It finishes with a brief discussion of key research questions to address in this second decade of the twenty-first century.

### **Early Demand Analyses**

Economists long sought to identify determinants of housing demand. Unlike most economic goods, dwellings do not have easily identified units of service, nor easily identified prices for those services. As a result, analysts often concentrated on aggregate housing expenditures as fractions of income, and on the impacts of changes in incomes and prices on these expenditures.

Richard Muth and Margaret Reid found that one percent increases in income were accompanied substantial increases in housing expenditures. Economists standardize these measures as *elasticities*, with income elasticity as:

$$\text{Income Elasticity} = E_y = \frac{\text{Percentage change in Housing Expenditures}}{\text{Percentage change in Income}}. \quad (1)$$

The matching one percent increases of income and expenditures imply constant income shares, or income elasticities of about +1.0 (or in Reid's analyses, even higher).

Similarly, looking across groups of households, or countries with similar incomes, housing expenditure shares seemed to be about constant irrespective of the prices. Similar to the income elasticity, the price elasticity is:

$$\text{Price Elasticity} = E_y = \frac{\text{Percentage change in Housing Expenditures}}{\text{Percentage change in Housing Price}}. \quad (2)$$

In demand theory, constant shares imply a price elasticity of -1.0 where higher prices lead to an equal offset in quantity purchased.

Combining these estimates with emerging urban economic theory explained the incongruity of poor people living in central cities on high priced land in high priced housing, while more affluent people commuted further as they demanded more and cheaper land (housing) in the suburbs. However, the aggregate analyses did not predict how individual families would react to changes in economic variables like price or income, or to changed demographic conditions like larger (or smaller) household size. The aggregate analyses did not address why some families rented and others owned, and they did not provide good guidance into how to implement demand-related housing policies.

### **Micro- Level Analyses**

With improved data and computing methods, housing analysts focused on microeconomic and econometric analyses. Modern housing demand analysis starts with the identity that housing is either owned or rented, and examines the behavioral determinants:

$$\begin{aligned} \text{Demand} = & \text{Probability of Owning } (f) \times \text{Owner Demand } (H_o) \\ & + \text{Probability of Renting } (1-f) \times \text{Renter Demand } (H_r) \end{aligned} \quad (3)$$

Analysts recognize that owner demand, renter demand, and probability of owning have behavioral components related to income  $Y$ , owner or renter price  $P_o$  or  $P_r$  and demographics  $D$ . An increase in income affects the quantities purchased by owners  $H_o$ , quantities purchased by

renters  $H_r$ , and the decision of whether to own or rent  $f$ . Allen Goodman parses the income effect into three parts:

$$\begin{aligned} \text{Total income elasticity} &= (\text{Income elasticity for owners}) \times (\text{probability of owning}) \times (\text{size of } H_o) \\ &+ (\text{income elasticity for renters}) \times (\text{probability of renting}) \times (\text{size of } H_r) \\ &+ (\text{size of } H_o - \text{size of } H_r) \times (\text{income elasticity of ownership probability}) \quad (4) \end{aligned}$$

The first two effects look at owner and renter demand separately, and the third recognizes that owner housing was traditionally “bigger” than renter housing and gave a bigger “bump” to housing demand. Similar decompositions apply to prices and demographic effects.

Measuring micro-level housing demand required advances in applied techniques. Neither income nor price is unambiguous. Because of the high transactions costs of moving, most analysts relate demand to permanent income following Milton Friedman. Observed income  $Y$  is the sum of permanent  $Y^P$  and transitory  $Y^T$  income components, and econometric theory shows how permanent income can be estimated as the return to human and non-human capital. Appropriate decomposition often doubles estimated “observed income” elasticities.

The price of a housing bundle is the multiple of a price index and a housing quantity. Whereas errors in income measurement bias the elasticity toward 0, errors in price measurement bias the price elasticity toward -1.0. Techniques related to hedonic prices, resale indices, or user costs have all been used to measure price.

Finally, although standard demand theory alludes in passing to factors other than price and income, demographics are critical in addressing individual housing demand. Old v. young, small v. large households, gender and education of household head, all make differences. A related literature in racial and/or ethnic housing discrimination has attempted to identify those differences in demand that we attribute to economic factors, and the residuals which may relate

to decreased opportunities due to discrimination.

Economists have estimated wide ranges of income and price elasticities, but the central tendencies are +0.5 for income elasticities and -0.5 for price elasticities. The decision to own is positively related to income, and negatively related to the ratio of owner to renter price. Overall impacts of changes in income and price in a framework like equation (4) vary in absolute value from 0.3 to 0.5.

### **How is Housing Different?**

Housing analysis involves distinctions between consumption and investment, and modeling the role of transactions costs. No other consumption good combines these two in the same manner.

For many, the home constitutes the largest and often the only major store of wealth. Although briefly supplanted as the leading source of wealth by financial instruments during the *dot.com* boom of the late 1990s, housing stock remains an important and highly illiquid form of investment. Because of this investment demand, analysts have believed that the size of the stock and the related consumption exceed the amount explained by consumption demand alone.

House purchases involve transactions costs that far exceed those of any other good. Substantial search costs, moving costs and down payments, in terms of money, and time costs related to acquiring information both for housing and financing, suggest that those who purchase housing services do not adjust immediately to changes in demand factors, and almost certainly adjust according to long term factors.

The ability to adjust at the margin without transactions costs implies, as with all other goods, the marginal rate of substitution of housing for other goods  $MRS_i$  equals relative prices:

$$MRS_i - \left( \frac{P_{\text{Housing}}}{P_{\text{Other goods}}} \right)_i = 0 \text{ in every period } i. \quad (5)$$

However, if consumers recognize the expense in moving each period, they optimize over a housing stay lasting many periods. Over that stay, the optimizing condition is:

$$\sum_i \left[ MRS_i - \left( \frac{P_{\text{Housing}}}{P_{\text{Other goods}}} \right)_i \right] = 0. \quad (6)$$

The sums of these differences relate to the costs of not adjusting at the margin – if over time they exceed moving costs, households will move.

After World War II many countries adopted self-amortizing mortgages, often with modest pre-payment penalties. Down payments of 10 to 20 percent typically acted as substantial transactions costs that led younger households to stay in rental housing. For owners in most parts of the United States, the nominal cost of housing stock did not fall for close to 60 years, and since mortgages were denominated in nominal dollars, households continued to build nominal equity. Indeed, households often seemed reluctant to default on mortgages even when it might have been economically appropriate to do so, the so-called “ruthless default” option. Andrew Oswald bemoaned the potential of owner-occupancy to reduce labor market mobility in Europe, but in the United States, because households could use the expected nominal appreciation to pay off existing mortgages, often with no capital gains tax, transactions costs once one had begun owner-occupancy became less onerous.

The U.S. housing price implosion, starting in 2006, and continuing into the second decade of the century, has turned much of the behavior upside down. Almost all buyers who purchased or refinanced homes after 2004 have found themselves “under water” when selling, having to write additional checks above the homes’ sale prices, or alternatively taking major

credit risks. Oswald's concerns for Europe have proven to be prescient for the United States, regarding the issues of home ownership's impeding labor market mobility and adjustment.

### **Housing Policy Issues**

U.S. housing policies have always promoted housing demand, and particularly home-ownership. Owners were purportedly more "stable" individuals who cared more for their property, leading to better neighborhoods. Increased housing demand also provided increased home-owner wealth.

Policies promoting home-ownership, have included the deductibility of interest rates, and the non-taxation of imputed rental income and capital gains on owner-occupied units. Explicit policies such as the Section 235 and 236 programs of the 1970s and the support of Fannie Mae and Freddie Mac, reflected a general societal goal of increasing ownership and housing demand.

Demand policies were also promoted since the 1970s in the United States to address housing needs of the poor. From the beginning of the twentieth century, public policies had focused on building housing developments or "projects." While public housing was not poverty housing by definition, after World War II they had become close to synonymous. Over 1 million units were built between 1933 and 1970. They were expensive to maintain and manage and the concentration of the poor became cause for major concern.

Housing demand voucher policies were promoted in the 1970s and 1980s. These were expected to reduce both the construction and management expenses, and if the elasticity was close to +1.0 as many thought, demand side subsidies could supplant the expensive supply side policies. The U.S. Department of HUD sponsored two major experiments in the 1970s to look at both demand and supply responses.

The demand results have been modest for three reasons. Providing and administering the demand subsidies is complicated, and even when available, many households did not adjust housing demand to the extent that earlier estimates had predicted. Further, the numbers of vouchers were limited as affordable housing did not become an entitlement.

### **Directions for Future Research**

Much of the post World War II housing demand research focused on the United States and U.S. institutions in the context of 60-plus years of nominal housing price increases. Better international data and more international researchers will help address whether different mortgage practices, or related social programs such as health insurance, in different countries affect tenure choice and housing demand.

The general house price increase from 1946 to 2006 led most consumers and lenders to expect it to continue indefinitely. Increased housing asset prices reduced user costs (due to expected asset price increases), cushioned moving and other transactions costs, and almost certainly increased housing demand. Financial constraints were well understood and could be addressed under the recognition that the existing instruments eased consumer adjustments.

Events since 2006 dictate that demand analysts must address the “lock in” effects on those who owe more than their homes are worth, the impacts on capital gains and taxes, the impacts on credit ratings, valuing housing during times of falling and unstable prices, and distinguishing between those who “can’t pay” from those who “won’t pay” their mortgages. Due to lags in collecting, cleaning, and processing consumer data, current empirical research is five or more years out of date. Efforts will require “pre-post” studies, comparing 2007 – 2009 demand, for example, with that in 2004 – 2006 using traditional methods, as well as modeling the demand in times of price volatility and falling market values.



*See also* Demand-Side Subsidies, Discrimination, Hedonic Pricing Model, Homeownership, Mortgage Finance, Public Housing, Residential Mobility

### **Further Readings**

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