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Authors
Rosen, Kenneth T.
Smith, Lawrence B.

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RECENT DEVELOPMENTS IN THE ECONOMICS OF HOUSING

BY

KENNETH T. ROSEN

LAWRENCE B. SMITH

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Recent Developments in the Economics of Housing

Kenneth T. Rosen
Professor of Economic Analysis and Policy
University of California

Lawrence B. Smith
Professor of Economics
University of Toronto

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INTRODUCTION

During the last decade a proliferation of literature has emerged on the economics of housing and housing markets. This development has occurred because of the growing recognition that although housing is an economic good that responds to normal market forces, it has a variety of unique characteristics that give rise to unique market relationships and enable its study to provide important and useful insights into economic behavior and market adjustment mechanisms. This paper reviews a number of the major recent developments in the economics of housing stressing the interaction of these developments with the special characteristics of housing, and demonstrates the potential of this sector for gaining further insights into both micro and macro-economic issues.

The paper begins in Section I with a brief review of the unique characteristics of housing and their market implications. The paper then examines the interaction of these characteristics on the important topics in housing economics and indicates the nature of housing market analysis. In Section II the market adjustment process is examined focusing upon the question of market disequilibrium in both the real and financial segments of the market. In Section III the implications of the market

adjustment process and special durability characteristic for the cyclical behavior of new residential construction are discussed. In Section IV the unique consumption and investment features of housing are considered, focusing upon their implications for price and income elasticities and the valuation of housing. In Section V the issues of house price inflation, special tax treatment of housing and the tenure choice decision are analyzed. In Section VI the merit good aspects of housing consumption are considered and the public policy aspect of housing is discussed.

SECTION I. HOUSING CHARACTERISTICS

Foremost among the unique characteristics of housing are its durability, spacial fixity, importance in consumer budgets and merit good designation.

A. Durability

The durability of housing is reflected in the fact that it is a capital good with an extremely long life (50+ years). This implies that the existing stock is quite important relative to the flow of new construction. Annual new construction increases the existing housing stock by only approximately 2.0-3.0 percent. In addition, at times the conversion response within the existing stock can be as important as new construction. Consequently, housing markets can be viewed as adjusting in a classic stock-flow manner, but as discussed below, with a long supply side adjustment lag.

The durability of the housing stock also causes housing to be both a consumption and an investment good. This means that an analytical distinction must be made between the demanders of the housing stock, whose behavior can be viewed as investors, and the demanders of housing services, whose behavior can be viewed as consumers. Complications

follow directly from this analytical distinction because, in reality, the distinction is artificial for the 65% of households who are owner-occupiers. This joint consumption/investment aspect substantially complicates the analysis of the tenure choice decision where both long and short term decision making is involved, and empirical work where a high proportion of the transactions are notional and hence require price imputations.

B. Spacial Fixity and Stock Heterogeneity

Unlike most commodities the housing stock is heterogeneous and spatially fixed, which impedes a relatively inexpensive dissemination of market information and introduces imperfections into the market.

The heterogeneity of the stock prevents the development of an organized commodity market (in the sense of a quoted price for a homogeneous unit of housing services) and means that accurate pricing information is not readily available without a lengthy and elaborate search procedure. This helps explain the structure of the real estate brokerage industry, since real estate agents reduce the costs associated with the search procedure. The heterogeneity feature also explains the widespread use of hedonic pricing models in housing research since the

hedonic pricing mechanism enables prices to be generated for standardized units of housing.

The spacial fixity of the stock causes housing services to be physically allocated between users by the movement of the users rather than the movement of the services. This allocative mechanism and search process associated with housing thus introduces substantial transactions costs into the housing market (in the form of high search, information and moving costs). It also means that a household is likely to be in disequilibrium with respect to its optimal housing consumption, since the household will not adjust its consumption until the present value of the expected benefits exceed the transactions costs associated with a housing adjustment. This implies that demand side market adjustments may also occur slowly or with a long lag. As a consequence of the lags in demand and supply, considerable attention has been given to the question of whether housing markets should be considered as markets in equilibrium or disequilibrium.

C. Relative Importance in Consumer Budgets and the Macro-Economy

In macro-economic analysis, housing, or residential construction is considered to be a vital sector of the

economy accounting for 5 percent of GNP, 30 percent of business gross fixed capital investment and approximately 4 percent of the national labor force. Because of its sensitivity and responsiveness to monetary variables residential construction is extremely volatile and so takes on added importance in macro-stabilization policy. However, its importance as a stock considerably dwarfs its flow importance. This is reflected in housing consumption being the single most important item in the average household's bundle of goods and services (reflected in its large weighting in the consumer price index), and in housing equity being the largest component of household's wealth, accounting for nearly 30 percent of total household wealth in 1982. Because of the importance of housing in household budgets, housing is often given special policy considerations. As a result a wide range of housing subsidies involving direct expenditures and indirect subsidies through the financing system and the taxation of housing have been implemented.

Because of the large capital cost of housing, most transactions involve special financing arrangements. Since the capital cost of housing is high in relationship to both annual services and annual income of households, nearly all transactions involve a mortgage loan. As a result, the real and financial sectors of the economy are especially

interwoven in the case of housing. Consequently, real housing activity is especially sensitive to changes in the cost and availability of housing (mortgage) credit, and monetary policy exerts a disproportionate impact upon the residential construction sector.

D. Merit Good and Externalities

Because housing is often considered to be a necessity, it is often viewed as a "merit good". This view is reinforced by the notion that housing consumption may generate positive externalities (in the sense of crime amelioration, health improvement, and better social and communal behavior). Consequently, the provision of adequate shelter in a suitable living environment has become a matter of public policy, and the real and housing finance markets are substantially affected by such policy. As a result housing and mortgage markets are characterized by a large amount of formal government intervention. In addition to direct subsidies and indirect finance and tax subsidies, housing markets are subject to a wide range of government regulations. Building and health codes, zoning and land use controls, rent controls, and the provision of public housing all influence the private housing market. As a result, the housing market is integrally related to

federal and local policy initiatives.

SECTION II: THE MARKET ADJUSTMENT PROCESS

The market adjustment process for housing differs from most consumer goods because of the durability of the housing stock, the spacially and quantitatively fixed nature of the stock, the relatively slow supply response and high transactions costs associated with the heterogeneity of housing units, and an allocative mechanism that physically distributes housing units between users by the movement of the users rather than the movement of the houses. The durability and relative fixity of the stock suggests that housing can be viewed within a stock-flow context. (Lawrence B. Smith, 1969; Edgar O. Olsen, 1969; Richard F. Muth, 1974; James S. Duesenberry, 1958). Within this framework, the stock demand and supply for housing services determine a price for a unit of housing services. This price interacts with operating costs (including depreciation), alternative asset yields and risk premia to determine a capital value for each unit of housing stock producing the housing services (Muth, 1960; James R. Kearl, 1979). The capital value relative to the supply price of new stock determines the flow of new housing and housing services. This general approach is consistent with the stock adjustment approach of Muth (1960), the supply model

approach of Smith (1969); Gordon R. Sparks (1967), the inventory adjustment approach of Sherman J. Maisel (1963, 1965a); and the capital asset price formulations of Kearl (1979), although they have quite different implications for the relationship between existing stock and housing starts. This section considers the market adjustment process and the possibility of market disequilibrium in both the price and supply arising from constraints on the demand side (household mobility) and supply side of the market.

A. Demand Side Constraints (or Household Mobility Constraints)

Households experience numerous constraints in making their potential demand effective in the housing market, and these constraints introduce considerable lags into the market adjustment process. The most commonly considered constraints are financial constraints associated with non-price credit rationing in the home finance market. Since these constraints restrain both the demand for the ownership of housing stock and the volume of new construction (primarily in a derived fashion by altering builder and developer expectations concerning the final demand for their product) a discussion of these financial constraints is postponed until Sections IV and V.

Abstracting from imperfections in the home finance market, households still experience a number of real constraints which prevent them from instantaneously adjusting their consumption of housing services.

The spacial fixity of the stock ensures the heterogeneity of the housing unit and prevents a relatively inexpensive disemination of market information. Consequently, market participants, both potential buyers and sellers in the homeownership market and potential tenants and landlords in the rental market, are forced to devote considerable time (and expense) to acquire information as to the value of the specific bundle of housing attributes associated with each individual housing unit (and in the case of landlords, on the quality of the potential tenant) (Muth, 1974). As a result there are considerable implicit and explicit search costs connected with a housing move (Peter T. Chinloy, 1980), including the time and opportunity cost associated with market search, and brokerage and agent fees incurred to help reduce implicit search costs.[1] In addition, in the case of homeownership, there are substantial transactions costs in the form of recording fees, legal fees, originating fees and "points " and refinancing costs associated with the non-transferability of existing low interest rate mortgages. The non-assumability of existing financing

means that the advantage of a low interest rate mortgage is lost to the homeowner on sale, and that the financing costs of a resold house increase by the difference between the current and existing mortgage rate on the outstanding mortgage balance.[2]

Finally, the immobility of the stock also necessitates that housing be physically allocated between users by the movement of the users rather than the movement of the house. Since such movements entail very large discrete adjustments by the household, additional large transactions costs are built into the allocative process in the form of moving costs, furnishings that become inappropriate, and psychological costs of breaking neighborhood attachments. (See Eric A. Hanushek and John M. Quigley, 1978; D. A. Weinberg, J. Friedman and S. K. Mayo, 1981).

The existence of the large search and transactions costs associated with a housing move means households are likely to be in disequilibrium with respect to their optimal housing consumption since a household is likely to maintain its disequilibrium position until the present value of the expected benefits from reducing the disequilibrium exceed the transactions costs associated with a housing adjustment. In addition to moving, homeowners can remedy their housing disequilibrium by undertaking housing alterations or additions, or by

allowing housing deterioration. Historically, these mechanisms have been used to remedy smaller disequilibrium imbalances, although they theoretically could be used to rectify any degree of imbalance (R. Mendelsohn, 1977; Stephen Margolis, 1981), and each of these adjustment forms contain their own transactions costs. Consequently, the housing response of households to changing income, price or other socio-economic variables often occurs slowly and with a considerable lag, thus, inhibiting demand side adjustments from equilibrating housing prices and vacancies in the short run with their long run equilibrium levels. (See Muth, 1960; David Blank and Louis Winnick, 1953; Ray C. Fair, 1972; Olsen, 1969; Maisel 1963 and 1965a).

This slow or incomplete response behavior is supported econometrically by both aggregate time series and micro cross section studies. Muth (1960), using time series analysis, found that households remedy approximately one third the difference between their desired and actual stock during a year (which implies six years are required for a 90 percent adjustment), Hanushek and Quigley (1978) and Weinberg, Freidman and Mayo (1981), using micro data for renters from the Housing Allowance Demand Experiment, both found that households were more likely to move as the degree of housing disequilibrium increased (a 10 percent increase in desired housing increased the likelihood of a

move by 9-15 percent (Hanushek and Quigley, 1978, p. 420), that the costs of moving are highly significant in influencing rates of household mobility, and that these cost variables explained more of the variation in mobility than did benefit variables. (Weinberg, Freidman and Mayo, 1981, p. 346).

B. Supply Side Adjustments (or Real Housing Constraints)

i. The Macro Evidence

In addition to slow demand adjustments, slow supply adjustments are required if disequilibrium prices or quantity conditions are to persist in the housing market. Considerable debate has occurred during the last few years as to the nature of the supply response, and in particular the difference between the short run and long run supply adjustments. Most of the evidence suggests that while initial supply responses are slow (Maisel, 1963, p. 369, 1965a, p. 183), the long run supply elasticities are relatively large. The question of market disequilibrium thus tends to become one of definition in the sense that a disequilibrium set of prices and vacancies can exist in the short run (Maisel, 1963; Muth, 1960; Fair, 1972) but that this state is only temporary and that the market is

continuously adjusting to its long run equilibrium.

The evidence supporting the existence of short run disequilibrium is quite strong. Muth (1960) has demonstrated on a very aggregative level that lags in the supply side reactions in the market for new homes prevent the market from adjusting immediately to changes in the desired stock demand. He also argues expectations about the future profitability of housing explains much of the lag in the rental market since investors do not immediately view changes in demand as permanent (p. 63). This position is strongly supported by Maisel's (1963 and 1965a) inventory adjustment model in which "disequilibrium reflects itself in changed vacancies" (1965a, p. 187), and variations in vacancies cause fluctuations in housing starts. In this approach the existence of vacancies above or below the equilibrium necessary for smoothly functioning markets is an indication of temporary disequilibrium as well as the mechanism by which the market adjusts to long run equilibrium.

Disequilibrium conditions are assumed to be more persistent in the rental than in the homeownership market. Blank and Winnick (1953) suggested that landlords will not respond initially to an increase in demand but "will passively accept increases in income resulting solely from increase in occupancy" (p. 189), thus letting rents remain

for some time at a non-equilibrium position (p. 198). Smith (1974a) and Rosen and Smith (1983) econometrically confirmed the Blank and Winnick rental adjustment process and supported the Maisel approach by demonstrating that the percentage change in rents varied inversely with lagged rental vacancies. This implies that rents do respond to changing relative demand conditions, but that this response is lagged and is reflected first in changed vacancies. Since new residential construction responds to the rent (or capital value) to construction cost ratio (see Grebler and Maisel, 1963; Fair, 1972), there is a considerable lag in the supply response of new construction to changing demand conditions.

The possibility of a more permanent disequilibrium in rental markets has been raised by Frank de Leeuw and N. F. Ekanem (1971) who argue that the long run supply of rental housing services is less than perfectly elastic. They found no relationship between rent and rental vacancies, suggesting that disequilibrium conditions could persist for a lengthy time. This non-traditional view was supported by A. A. Eubank and C. F. Sirmans (1979) who found that vacancy rates have an insignificant effect upon rent adjustment (p. 168) and Ira S. Lowry (1981) who, reporting on the HUD housing allowance experiment, claims "that relative vacancy rates have virtually no effect on market

rents, although they powerfully affect property values".

Nevertheless, if a Maisel type inventory adjustment process or a capital value adjustment process determines new construction activity, a supply response will occur even if the rent-vacancy nexus is poor, but the adjustment would be slower and disequilibrium conditions persist longer than in the more traditional approaches. Recent work by Kenneth T. Rosen and Lawrence B. Smith (1983) suggest, however, that the traditional rental price adjustment is correct and that rents do respond to variations in vacancies around their natural vacancy rate. They also demonstrate that natural vacancy rates vary between cities, and that variations in the natural vacancy rate could explain the failure of other studies to find a significant relationship between rent variations and the actual vacancy rate.[3]

Finally, returning to the overall question of market disequilibrium, Fair and Dwight Jaffee (1972) applied estimating procedures for markets in disequilibrium to the housing market and found that somewhat better results could be obtained in explaining housing starts by treating the market as if it were in disequilibrium. However, their estimation procedures were applied only to a specific forecasting model, and not tested over a variety of models, and the coefficient estimates yielded by the disequilibrium

estimation procedures were not much different from the estimates obtained under the assumption of full equilibrium.

Although the existence of a clearly defined unambiguous disequilibrium state is not conclusively demonstrated by any individual macro study, the preponderance of macro evidence does support a slowly adjusting market in which non-equilibrium conditions may persist for some time.

ii. Micro-Evidence

Two micro or disaggregated issues that influence the supply adjustment process center on the question of land use constraints, and the specification of production functions and the degree of factor substitutions in housing.

a. Production-Function-for-Housing-and-Factor-Substitution

Apart from general macro models, little work was done until recently on the supply of housing, or more particularly on the production function for housing. The production function, however, is important in the market equilibrium debate since a high elasticity of substitution between factors implies that factor constraints, if they exist, will not substantially affect the long run supply

response, and that this disequilibrium will not persist in the long run.

Recently, a number of studies have been conducted on the properties of the production function for housing, fitting CES (Muth, 1969; R. Koenker 1972; G. Fallis, 1977; J. Clapp, 1979), VES (J. B. Kau and C. F. Lee, 1976; C. F. Sirmans, Kau and Lee, 1979), Translog (Robert H. Edelstein, 1981) production functions, and in inferring supply elasticities from expenditures and economic rent (B. Smith, 1976). Not surprisingly, given the various functional forms fitted and the local variations that could exist between geographic areas investigated (Edelstein, 1981, p. 3) no clear consensus exists as to the elasticity of substitution for land and non-land improvements. However, the most recent studies all conclude that the elasticity of substitution between land and non-land in housing appears to be numerically greater than had been assumed in earlier studies, and appears to lie near 1.0. (Smith, 1976, -1.2; Clapp, 1979, -1.0; Sirmans, 1977, -.86; Edelstein, 1981, -0.5 to -1.3). Since the elasticity of substitution has a direct impact on the density of land use, and density has a direct bearing on the value of housing supplied per unit of land, the elasticity of substitution is important for determining the elasticity of the value of housing supplied per unit of land with respect to changes in the price in

housing. B. Smith (1976) estimated the elasticity of density per unit of land and elasticity of quality with respect to the price of housing to be 5.3 and 3.8 respectively, while Edelstein (1981) estimated the elasticity of the value of housing supplied per unit of land with respect to the price of housing to be about 7.0. Consequently, in the long run the supply of private sector housing responds strongly to price changes and there is little reason to believe that supply constraints cause disequilibrium conditions to persist over long periods in the housing market.

b. Land-Use-Constraints

Despite the conclusion in the previous section that the long run supply of housing is relatively elastic, the short run supply curve may be much less so, primarily because of various land use constraints. Although relatively small increases in the stock demand require relatively large increases in the flow of productive factors devoted to housing, non-land factors of production (labor, capital, building materials and entrepreneurial talent) are usually not considered to impose a production constraint because these factors are not specific to the housing industry.[4] The real constraint most often considered to be binding on

the supply of new housing is the availability of land.

The previous section indicated that the long run elasticity of substitution between land and non-land factors was approximately 1.0 so that land constraints can be overcome over time by increasing densities and housing quality per unit of land. However, in the short run density and quality changes may be impeded by land use controls.[5]

If land use controls are an effective constraint upon supply, they should be reflected in a land price above the non-control equilibrium. (See James C. Ohls, Richard Weisberg and Michelle I. White, 1974; and Lawrence H. Stull, 1974) Empirical work on zoning by Lynn B. Sagalyn and George Sternlieb (1972) and George E. Peterson (1974a) found that zoning density controls had a significant effect on the price of land per unit. However, work by John P. Crecine, Otto A. Davis and John E. Jackson (1967) and by Frederick H. Reuter (1977) on Pittsburg; Steven M. Moser, William H. Riker and Richard N. Rosett (1979) on Monroe County, New York; and Stull (1975) on Boston had conflicting results for the effect of zoning on the value of single family residential properties. Work by Muth and Wetzler (1976) indicates that building codes add almost 2 percent to building costs while Stephen B. Seidel (1978) found that unnecessary subdivision regulation increased

selling prices by 2.3 percent in New Jersey. Growth management systems ranging in forms from building freezes to limiting urban services to a vast array of planning permissions were also shown to raise costs by Gleeson (1979) for Brooklyn Park, Minnesota and Schwartz et. al. (1979) for Petaluma, California. Finally, Rosen and Larry Katz (1982) using a hedonic price approach found that growth moratoria and growth control plans raised house prices in the San Francisco communities in which they were present by 18-28 percent.

These studies indicate that zoning and other land use controls have raised prices in those communities in which they are present and hence have imposed effective constraints on the short run supply of land. Reinforcing this is the result of a national builders survey (reported in Seidel, 1978) that in 1975 only 14.5 percent of the developers were able to gain subdivision approval in under seven months and 58 percent required over a year, clearly indicating the existence of response lags in housing supply.

Consequently, short run supply constraints prevent rapid supply responses and permit non-equilibrium conditions to persist for some period of time. But in the longer run supply elasticities appear sufficiently large to restore market equilibrium.

SECTION III: INCOME AND PRICE ELASTICITIES OF THE DEMAND FOR HOUSING; HEDONIC PRICE INDICES OF HOUSING

A. Income Elasticity of the Demand for Housing

One of the most frequently studied and most important areas of research from a policy perspective concerns the income elasticity of demand for housing. Estimates of the responsiveness of the demand for housing to changes in income, despite a substantial effort by researchers to reconcile the differing empirical evidence, are still uncertain. Aggregate performance of the housing sector adds to the confusion. While we have had a vast improvement in the quality of the housing stock in the past three decades, the "low income housing problem" persists and there is an increased perception of an affordability crises in housing by young and middle income households. Also, the rise in the aggregate U.S. housing expenditure/income ratio in the past decade seems to contradict the careful analysis of A. Mitchell Polinsky (1977) and Polinsky and David T. Ellwood (1979) indicating that the income elasticity of demand for housing is substantially below 1.

The research on the income elasticity of the demand for housing centers on a simple equation taken from Polinsky

and Ellwood (1979): (1)

$$\log q_H = \beta_o + \beta \log y + \beta_2 \log P_H + \beta_3 \log P_o + u, \quad (1)$$

Where q_H is the quantity of housing services consumed, y is permanent income, P_H is the price of housing services, and P_o is the price of all commodities other than housing. The large variations in estimates for β were first reconciled by de Leeuw (1971). After correcting for various specification differences he concludes that the "elasticity of rental expenditure with respect to normal income appears to be in the range of .8 to 1.0.....while the preponderance of cross-section evidence supports an income elasticity for homeowners moderately above 1.0" (p. 10). In contrast, Polinsky (1977) concludes, after accounting for the differences between micro and metropolitan (grouped results) and correctly treating the price term, that the income elasticity of demand for housing is .75.

The uncertainty surrounding the income elasticity can be seen from a brief survey of the conflicting empirical studies that de Leeuw (1971) and Polinsky (1977) seek to synthesize. Muth (1960), based on a 1950 cross section sample of average value of single family homes found an income elasticity of 1.68. Margaret Reid (1962), based on

inter and intra metropolitan data for 1950, found income elasticities for homeowners of 1.55-2.05 and for renters of .8 to 1.16. Ton Hung Lee (1968), based on a sample of individual households (rather than grouped metropolitan data), found an elasticity of .65 for renters and .8 for homeowners. Alan Winger (1968), using a sample of FHA-203 housing transactions, found an income elasticity of 1.05. Maisel, Burnham and John Austin (1971), found elasticities based on FHA data for both micro and grouped data of .46 to .90. Geoffrey Carliner (1973), using micro data similiar to Lee (1968), found an elasticity of .48 for renters and .57 for owners. Mahlon H. Straszheim(1975), using similar data, found an elasticity of .42. De Leeuw (1971), using data based on the 1960 Census, found elasticities for renters of .81 to .99 and for homeowners of 1.1 to 1.35. Polinsky and Ellwood (1979), using FHA data and a correctly specified equation, obtained estimates of the income elasticity of demand of .39 based on micro data and .57 based on grouped data. Since Polinsky and Ellwood recognize that FHA data is a non-representative sample of house purchases (the maximum mortage amount induces some upper income households to purchase less housing to qualify for the program, while the minimum FHA quality standards might induce some lower income households to raise their housing consumption to qualify for an FHA insured loan)

they adjust their estimates up to .80 and .87. Despite their careful attempt to avoid specificiation error this adjustment, based on an earlier regression by de Leeuw (1971), appears to be somewhat ad hoc. Harvey Rosen (1979), correcting for the bias that arises from excluding the income tax deductions associated with owner-occupied housing, estimates income elasticity of .35. Eric Hanushek and John Quigley (1981), summarizing the results of the housing allowance experiment and the income maintenance experiments, state "that an upper limit on the income elasticity of demand is about .5". (p. 204). Edwin S. Mills and Arthur Sullivan (1981), also using micro housing allowance data on low income participant households, estimate an elasticity of .36 for renters and .6 for owners. In our view, despite the large number of studies and the careful attempts at reconciliation, the income elasticity of the demand for housing is uncertain. Over the last two decades, successive estimates of the income elasticity have generally decreased and are now less than 1.0, but no clear consensus has emerged as to the actual elasticity. Moreover, during this time the ratio of housing expenditures to income has risen with rising real income, suggesting either a major empirical inconsistency or a very strong relative price effect. Additional studies, which avoid the specification errors pointed out

by de Leeuw (1971), Polinsky and Ellwood (1979), and Rosen (1979), and estimated on a more representative sample of households, are clearly needed.

B. Price Elasticity of the Demand for Housing

Estimates of the price elasticity of the demand for housing are derived from a subset of the studies described above. De Leeuw (1971) estimates corrected price elasticities of -.7 to -1.5. Polinsky (1977) and Polinsky and Ellwood (1979) estimate corrected price elasticities of -.7 to -.75. Maisel, Burnham, and Austin (1971) and Carliner (1973) report price elasticities of -.92. Hanushek and Quigley (1981) report that the housing allowance experiments show a much lower price sensitivity for low income households of -.2. In addition to the uncertainty of existing estimates, the rapid house price inflation of the last decade and the rise in the housing expenditure/income ratio, necessitate additional studies of both price and income elasticities.

C. Hedonic Price Indices of Housing

The heterogeneous nature of the housing market and the observation that housing services are defined by a bundle

of characteristics has lead to the adaptation of the hedonic price model of Sherwin Rosen (1974) to the housing market. The generalized form of the hedonic house price equation, from D. R. Grether and Peter Miezkowski (1974) is set out in equation (2)

$$V_i = \alpha S_i + \beta L_i + \gamma N_i + \varepsilon_i \qquad (2)$$

Where s_i, L_i, and N_i are vectors of characteristics of the structure, lot, and neighborhood associated with house i, and α, β and γ are the estimated weights (prices) of the characteristics. Neither supply nor demand characteristics can be identified from this equation. It is defined exclusively over the vector of characteristics with the partial derivates interpretable as the implicit marginal characteristic prices at a particular market equilibrium. Usually, as in equation (1) no intercept is specified and hence the implicit marginal prices are also average prices. As Richard Butler (1982) has pointed out "finding the correct specification of the hedonic relationship for housing requires that we identify both the correct list of independent variables and the true functional form" (p. 96). In fact, for the housing market we know neither. As a result the choice of both functional form and the choice of independent variables has been an empirical question. Grether and Miezkowski (1974), Butler (1982), Peter

Linneman (1980), and Kain and Quigley (1970, 1975) have all used several functional forms and an array of independent variables. Butler (1982) concludes from a careful comparison of differently specified models that the costs of misspecification for a hedonic regression on ordinary housing units are not large. Thus, despite this somewhat "messy" state of hedonic house price theory, the hedonic price approach is extremely useful for a wide array of research on housing markets.

SECTION IV. HOUSING CYCLES AND HOUSING FINANCE

Residential construction has been characterized by large variations in levels of output. Two types of instability in housing production have been discussed in the literature. Long "swings" or cycles of 15-25 years have been documented by Simon Kuznets (1952) and Leo Grebler, David Blank, Louis Winnick (1956). These fluctuations have generally been related to changes in immigration, urban-rural migration, and the baby boom that followed World War II. Recently the demographic attention has switched to the impact of changing household headship rates on long-term housing demand. Studies by R. A. Easterlin (1966) and Jaffee and Rosen (1979) focus on the long-term relationship between population change, household formation, and housing demand.

Most of the post-1960 literature, however, focuses on the short-cycle in housing construction. This cycle in building activity, which proceeds or is coincident with the ordinary business cycle, has occurred eight times in the post-war period. From peak to trough the average decline over the short-cycle in housing construction has been 45%. As a result of this cycle residential construction is perceived as a balance-wheel, tempering excess demand during periods of expansion, and often leading the

economy-wide recovery from recession. In our view, however, housing, due to its greater sensitivity to monetary policy changes, simply precedes rather than actually counter-balancing economy wide slowdowns and booms. A sharp decline in housing starts is usually a reaction to excessively stringent monetary policy which destabilizes both the housing market and eventually the overall economy. Thus housing rather than being counter-cyclical, is really the leading indicator of instability.

A major portion of the literature reviewed agrees that short-run variations in housing activity (as measured by private nonfarm housing starts) are due to the overwhelming dependency of housing on mortgage credit, to deficiencies in the U.S. housing finance system which provides this mortgage credit, and to the significantly higher interest elasticity in the housing market relative to other investment markets. Grebler and Maisel (1963), in a study for the Commission on Money and Credit, summarize their review of previous analyses with the conclusion:

> "While these analyses differ on matters of emphasis and detail they agree in the conclusion that short-run fluctuations in residential building have resulted mainly from changes in financial conditions labeled borrowing, availability of mortgage funds, and supply of mortgage credit."

Similarly, a major study headed by Irwin Friend (1970) stated:

> "The greater impact on monetary stringency on housing than on the rest of the economy apparently is due mainly to a capital rationing effect, resulting from deficiencies in current institutional arrangements for providing mortgage credit: and probably also to an interest rate effect, reflecting a greater interest elasticity of housing demand than of demand generally." (p.8)

Finally, recent academic wisdom regarding the primary cause of fluctuations in housing construction is best summarized by James B.Burnham (1972):

> "There is general agreement that one of the primary, if not the primary, determinant of this cyclical pattern is the similar pattern that holds with respect to a critical input in the residential construction process: the supply of mortgage credit." (P.81)

All of the studies emphasize the primary role of the supply of mortgage credit and the secondary role of the price of mortgage credit, which results from the view that the mortgage interest rate is not in itself an adequate indicator of the state of the mortgage markets. Unlike other markets, it is implicitly or explicitly assumed that the price of the commodity (in this case mortgage credit) does not "clear the market". That is, the supply of mortgage funds does not generally equal the demand for

mortgage funds at the market interest rate. This rationing or disequilibrium characteristic of the mortgage market is responsible for the difficulty in obtaining mortgages during periods of financial restraint. During these periods many households are not able to obtain any mortgage at the quoted interest rate ,and rationing techniques, such as raising the loan to value ratio, tightening borrower income requirements, imposing a ceiling on loan size or limiting loans to large depositors of long-standing, are employed.

Basic defects in the U.S. housing finance system are usually the main factors used to explain the rationing or disequilibrium phenomena and the housing cycle. The poor portfolio balance of the major mortgage lenders (savings and loan associations), state usury ceilings on mortgage interest rates (James R. Ostas, 1976), regulation Q ceilings on passbook accounts of thrift institutions (Craig Swan, 1973, 1970) and FHA and VA ceilings on mortgage interest rates (Jack Guttentag 1975; Lawrence B. Smith, 1977; Jaffee and Rosen 1978, 1979) are all usually cited. However, based on the Canadian experience, even if many of these defects were overcome, it is likely that housing would continue to exhibit a similar, although slightly dampened, cyclical volatility as a consequence of the relatively high interest elasticity of demand (L. B. Smith, 1977).

The problem of cyclical instability of mortgage flows is centered on two portfolio choice decisions and institutional constraints under which these decisions are taken. The first choice concerns the way individuals allocate their personal savings among various financial intermediaries and other assets. The second choice concerns the portfolio composition of the financial intermediaries themselves.

Historically, during periods of credit restraint, the yields on savings deposits at thrift institutions, because of their portfolio composition (with a fairly large concentration of long term mortgages induced by legal portfolio restrictions) and because of Regulation Q interest rate ceilings, fell relative to open market (especially short-term) credit instruments. This was particularly true of savings and loan associations passbook accounts. When the monetary authority pursued a restrictive policy, the savings flows from the households move away from the savings and loan associations toward other intermediaries and general capital market instruments. In the past four housing cycles, there have been extended periods with negative savings flows (disintermediation) to the savings and loan associations. Such liquidity crunches have resulted in drastic declines in mortgage commitments by S & L's, and because of their

large role in the mortgage market, lead to a sharp decline in housing starts. It was this disintermediation process which was primarily responsible for the credit rationing characteristic of the housing market. (William Gibson 1973); Craig Swan 1970; Jaffee and Rosen 1979).

The second portfolio choice decision is that of the financial institutions themselves. While savings and loan associations, because of tax laws and regulations, have had little portfolio flexibility, other financial institutions showed a moderate amount of shift in their investments over the economic and housing cycles. Because of a high interest rate elasticity of demand for mortgage credit on the part of households, during periods of rising interest rates, mortgage interest rates rise less than rates on comparable assets. As a result, mortgages become less attractive investments vis-a-vis other assets. Thus a second portfolio shift, by intermediaries away from mortgages, compounded the problem of flows of savings deposits away from the mortgage creating intermediaries (Guttentag, 1975; Jaffee, 1972).

While there is substantial concensus that the substantial concensus that the availability of credit matters to the short-run housing cycle there is a substantial dissent to this view. Allan H. Meltzer (1974) and F. Arcelus and Meltzer (1973) stongly question the view

that the "availability" of credit matters to housing. Swan (1973) has strongly critiqued this view. Essentially the Meltzer argument and econometric analysis shows that in the long-run credit availability does not effect the stock of housing. One would have to agree with their view that real interest rates, prices, real income, and demographics are the fundamental long run determinants of the stock of houses. It is in extending this argument to short-run cyclical fluctuations that Meltzer may be in error, and in his second paper (1974) he admits that "some short-term effects may occur".

Public policy towards the cyclical instability in residential construction is based on the premise that cyclical instability in mortgage lending causes fluctuations in housing activity. As a result, stabilizing the flow of mortgage credit to the housing market appears to have become a major goal of federal housing policy. The establishment of FHLMC (Federal Home Loan Mortgage Corporation),the reorganization of FNMA (Federal National Mortgage Association), the new aggressiveness of FHLBB (Federal Home Loan Bank Board), and the reorientation of GNMA (Government National Mortgage Association) can all be viewed as at least partial attempts to insulate the mortgage and housing markets from general financial restraint.

A number of papers have attempted to test the effectiveness of these government policies. W. L. Silber (1973); Jaffee and Rosen (1978); Jaffee (1972); Swan (1970); Rosen and David Bloom (1980); and George Von Furstenberg (1976) test the effectiveness of these government programs. The conclusion of these studies is that these programs are only partially effective due to general capital market feedback effects on the private mortgage market. These programs have a net effectiveness of 20-35%, with the bulk of the impact coming within 3 to 4 quarters. These studies tend to agree with Metlzer (1974) that there is little or no long-run impact of these policies.

Future research into cyclical instability in residential construction will likely take a very different turn. The deregulation of deposit and liability structure of savings and loans, the elimination of state usury law ceilings, the rapid development of the secondary mortgage market, and the widespread use of variable rate mortgages will shift the emphasis from credit availability to interest rate elasticity effects. As a result of this structural shift in the mortgage market, a whole new conceptual and policy framework will have to be developed.

SECTION V. HOUSING--TAX--INCENTIVES, INFLATION AND TENURE CHOICE

A. HOMEOWNERSHIP TAX INCENTIVES

The importance of housing in household budgets and the view that housing is a merit good have led to a special tax treatment for housing, and especially for owner occupied housing. These tax advantages for homeownership occur because the major expenses associated with homeownership, mortgage interest and property taxes, are tax deductible, while the income associated with homeownership, net imputed rent and capital gains on resale, are tax exempt and tax deferred respectively.[6] Benefits for rental housing also arise through the tax code. Depreciation allowances in excess of true economic depreciation (at present the code assumes a 15 year life for depreciation purposes), capital gains treatment for most realized gain, tax shelter features (allowing book losses as deductions against other income) and tax deferrals by property exchanges all substantially benefit investors and consumers in the rental market.

Since inflation has considerably increased the effective benefits provided by these tax concessions, the impacts of these advantages on the allocation of resources and on the household tenure choice decision have become the subject of much recent research. Although this research

has taken numerous approaches, including theoretical (David W. Laidler, 1969; Douglas B. Diamond, 1980; Yoram Weiss, 1978; and Sheridan Titman, 1982), present value analysis (De Leeuw and Larry Ozanne, 1979), empirical (Harvey Rosen and Kenneth Rosen, 1980; and John Shelton, 1968), and simulations (Patric H. Hendershott, 1980; Hendershott and S. C. Hu, 1981; Hendershott and Shilling 1981; and A. Dougherty and R. Van Order, 1982), these studies have reached remarkably similar conclusions. They have concluded that tax preferences have strongly favored and encouraged homeownership, have transferred resources to more heavily subsidized owner-occupiers from generally less-subsidized renters (Lawrence White and Michele White 1977), have raised the gross price of homeownership housing services, but lowered the net after-tax price, and have directed resources in favor of housing and away from "productive" capital uses (Weiss, 1978, and Hendershott and Hu, 1981). Empirical estimates suggest that personal income tax benefits for homeownership increased the proportion of homeowners by approximately 4 percent (from 60 to 64 percent) (Rosen and Rosen, 1980, p. 70; Hendershott and Shilling, 1981, p. 27) and that approximately one quarter of the increase in homeownership since the second World War can be attributed to these tax

factors (Rosen and Rosen, 1980, p. 70). Because the basic approach underlying much of this work is the user cost of housing approach which is similar to that used in the analysis of inflation and tenure choice, a discussion of the methodology is included in the next section.

B. ~~INFLATION AND AFFORDABILITY~~

The impact of inflation and the public policy emphasis on the right of every American to decent housing at an affordable cost has caused considerable attention to be focused on the issue of the affordability of housing, and especially on the relationships between affordability, inflation, and tenure choice. At the heart of this issue is the apparent paradox that although rising interest rates and rising nominal house prices combine to substantially increase the monthly cash flow costs of homeownership, the average age of homebuyers has declined, the proportion of homeowners to renters has increased and real house prices have increased during the 1970s.

Two quite different approaches have been taken to explain the relationship between affordability and inflation. The first approach, taken by Hendershott , (1980); Hendershott and Hu, (1981); Hendershott and Shilling (1981); and Weiss (1978); and to a lesser extent

Diamond, (1980); de Leeuw and Ozanne, (1979); and Rosen and Rosen, (1980), centers on the user costs of homeownership (or the real return to homeownership) and tax preferences for homeownership, and argues that the interaction of inflationary expectations and tax preferences increases the real affordability of homeownership. The second approach taken by Donald Lessard and Franco Modigliani (1975), Kearl (1979), and Schwab (1982), centers on the capital market and argues that the cash flow or "tilt" problem associated with rising anticipated inflation and the traditional mortgage instrument reduces the affordability of homeownership for new home buyers.

1. THE "USER COST" OF HOUSING

The user cost of housing, which is similar to the user cost of capital (Dale W. Jorgenson, 1971)*, is essentially the real rental rate that a household would pay to obtain the use of a unit of housing services, whether that unit was actually rented or owner-occupied. For homeowners, the expected user cost over any time period assuming capital gains are fully tax exempt may be defined as in equation (3)

$$UCH = o + d + (1 - \phi)\ (t + m + Ei) + \phi S - \Delta PH^{e} \qquad (3)$$

where o is the expected operating costs (excluding property taxes), d is the expected economic depreciation, ϕ is the household's expected marginal tax rate, t is the expected property tax[7], m is the expected mortgage interest, Ei is the expected foregone interest at rate i on the homeowner equity[8] E, S is the household minimum standard deduction (see Diamond, 1980,) and ΔPH^e is the expected capital appreciation of the house from its depreciated value.

For tenants, the expected user cost of housing services is the expected rent, R. Since in equilibrium owners of rental housing should earn the same after-tax returns corrected for risk as owners of other assets, the tax benefits for investment in rental housing will be passed on to tenants in the form of a lower rent. These tax benefits arise primarily from the excess of accelerated depreciation da, over economic depreciation d, and from the capital gains treatment of gains on disposition over economic depreciation. If h represents the fraction of the excess depreciation ultimately tax saved (i.e. the present value of the tax postponement since excess depreciation is considered recaptured and taxed on disposition) and k represents the fraction of capital gains ultimately taxed (since 60% of long-term gains are exempt and taxes are not

due until sale), the expected user cost of rental housing services is set out in equation (4)

$$R = R_n - \phi_R \{h(da - d) + (1 - k)\ \Delta PR^e\} \qquad (4)$$

where R_n is the expected rent in the absence of rental tax benefits, ϕ_R is the expected marginal tax rate of the marginal owner of rental housing, ΔPR^e is the present value of the expected appreciation in the price of a rental unit.

It can be seen immediately that tax concessions lower the after-tax user cost of housing for both renters and homeowners, that the benefits of tax concessions increase with the marginal tax rate of homeowners and investors in rental housing, and that the effect of inflation on tenure choice depends upon the inflation induced change in the relative user cost of homeownership compared to renting.

Under the user cost approach, the impact of inflation on affordability and tenure choice depends on the relationship between inflation, interest rates and housing price expectations. Since expectations of rising inflation increase the nominal rate of interest, higher anticipated

inflation raises both the mortgage cost and foregone interest cost of homeowner equity. Assuming that house price expectations are homogeneous to degree one with general price expectations, and that general price expectations are fully incorporated into the rate of interest with no tax or other premiums, higher interest costs will fully offset on a pre-tax basis the anticipated increase in house prices for new homebuyers and existing homeowners with variable rate mortgages. This happens because the sum of homeowner equity and the outstanding mortgage debt is equal to the value of the house. On an after-tax basis, however, interest costs increase by only $(1 - \phi)(\Delta m + E\Delta i)$ while the expected capital gains are approximately the untaxed amount as a result of the tax exemption and tax deferral. Consequently, except in the limiting case of $\phi = 0$, an increase in inflation under the above assumptions causes the combined price appreciation and interest rate effect to exert downward pressure on the after-tax expected user cost. The full impact of inflation on homeownership user costs depends not only on the price expectation and interest effects, but also upon the inflation induced increase in operating costs, after-tax property taxes and depreciation costs. Because these latter costs are only a fraction of total homeownership user costs in the normal case where interest costs exceed

expected price appreciation, if both these costs and income rise proportionately with inflation, the ratio of expected user costs to income falls with rising inflation.*

Inflation also reduces the real user cost of rental housing, but the direct decline prior to households readjusting their tenure choice is likely to be less than for homeownership. Real rental costs decline because the increase in interest costs, as well as other operating costs and taxes, are fully tax deductible while the increase in expected capital appreciation is usually taxed as a capital gain. Since, the proportion of capital appreciation ultimately taxed on rental housing is much larger than on owner occupied housing, the impact of inflation on the real user costs of rental housing is less than on owner-occupied housing.[9] This differential is increased by the tax treatment of depreciation since depreciation is based on historic rather than replacement cost. For tax purposes depreciation costs are thus unaffected by inflation, and the real value of depreciation allowances declines with inflation.

Consequently, if capital markets were perfect and national capital gains could be financed costlessly, the interaction of inflation and tax concessions for housing would increase both total housing demand and the homeownership proportion of this demand. This shift in tenure preferences in favor of homeownership would increase

house prices and lower rents until the expected user cost of homeownership equals the expected rental cost of equivalent housing services for the marginal household. In the longer run, this would increase the flow of resources for homeownership housing, reduce the flow for rental housing, and increase the overall flow of resources for housing.

2. THE "TILT" PROBLEM

In contrast to the preceeding approach which assumes perfect capital markets and focuses on real after-tax returns, the second approach has concentrated on the capital market imperfections as embodied in the "tilt" problem. This problem arises because an increase in the anticipated inflation rate affects the level of interest rates but only the rate of change of household income. As a result, although increased inflation does not alter the present value of future mortgage payments, it changes the time profile of real mortgage payments under the traditional level payment mortgage (LPM) by increasing the payment to income ratio in early years and reducing it in later years. An increase in the fully anticipated inflation rate raises the rate of interest as expectations

of future inflation are incorporated into the nominal rate of interest. If an increase in the anticipated inflation becomes realized, household income will also rise in nominal terms, but only by the increase in the rate of inflation. Consequently, even if the price of a house were to remain fixed, the mortgage payment to income ratio under a LPM would increase in the years immediately following an increase in the fully anticipated inflation rate.

This increase in the payment to income ratio introduces a cash flow constraint for households, and even though the after-tax user cost of homeownership may decline in real terms, according to this approach the affordability of housing and real demand for homeownership declines. This apparent paradox is partially explained by the fact that much of the decline is user-costs is attributable to higher expected house appreciation, and this appreciation is notional and does not generate a corresponding cash flow.

Because increased inflation only changes the time profile of real mortgage payments, but does not raise the present value of such payments nor the user costs of homeownership, the effect of inflation on housing demand is attributed to capital market imperfections(Kearl, 1979; Schwab, 1982; Modigliani and Lessard, 1975). This argument may be seen by recognizing that in a world of perfect capital markets and no transactions costs, an incremental

lending process could be generated in an inflationary environment to replicate the net payment structure under a non-inflationary environment. Such a lending process would involve a series of early year incremental borrowings and later year repayments to offset the "tilt" problem and equate the real payment streams and payment to income ratios in the inflation and non-inflationary cases (Rosen, 1977). The failure of such incremental lending schemes to become widespread is usually attributed to such market imperfections as the imposition of arbitrary lending rules by financial institutions concerning maximum loan size and the ratio of mortgage payments to current income to qualify for mortgage finance. However, the failure may also be a manifestation of increased contract costs associated with an unstable monetary environment.

In an attempt to overcome the reduced affordability of housing associated with the tilting of real mortgage payments and reduce disintermediation problems of financial institutions associated with rising interest rates, a number of alternative mortgage designs were suggested in the late 1970's and early 1980's. These instruments were of three general types, variable rate mortgages, graduated payment mortgages and price level adjusted mortgages. Lessard and Modigliani (1975) provide the most complete analysis of the probable effects of these instruments.

C. DEMOGRAPHIC EFFECTS ON TENURE CHOICE

The tenure choice decision, however, is more than a response to inflation and tax concessions. The decision is substantially influenced by life cycle and other demographic forces, and the real permanent income of households. The life cycle and demographic forces can be seen clearly by homeownership rates by age and marital status, which indicate that homeownership rates for primary households rise from .25 for households whose head is under 25 years to .77 for households whose head is 35-64 years (see Jaffee and Rosen, 1979). Because the age and household composition (ie. family vs. non-family) of the population have been changing dramatically, aggregation hides much of the change in homeownership behavior. Jaffee and Rosen (1979) demonstrate this by developing a time series on owner-occupancy that controls for the changing distribution of age and household type. They suggest that had there been no age and household composition effect, the overall owner-occupancy rate would have increased two to three times as rapidly in the past two decades. Thus, while the observed increase in the proportion of owner-occupancy (from .62 in 1960 to .65 in 1980) supports the user cost approach that housing has become more affordable, the

sharper increase in the demographic adjusted proportion makes this argument even stronger. Consequently the interaction of inflation, homeownership tax preferences and capital market imperfections on housing appears to have stimulated homeownership in the 1970's.

SECTION VI. ASSESSMENTS OF FEDERAL POLICY TOWARDS HOUSING

Previous sections of this paper have dealtwith studies on indirect subsidies to housing through the finance (the end of Section IV) and tax systems (Section V). As a result, this section deals only with direct subsidy programs. These include production programs such as public housing, Section 235 and 236, Section 8, and demand side subsidies of the Experimental Housing Allowance Program.

Comprehensive statements and assessments of the problems of housing sector and potential policy solutions are provided in three government commissioned reports: The Douglas Commission Report (1969), The Kaiser Commission Report (1968) and the recent Report of the President's Commission on Housing (1982). The Douglas and Kaiser Commission reports reflect the spirit of the late 1960's and set ambitious housing goals which call for substantial government intervention. The Report for President Reagan reflects in part the general mood toward deregulation and the reduction in role of government in solving social problems. The President's Commission recommends an increased reliance on market forces for the housing and housing finance industries. The role of government is limited to indirect subsidies through the tax system and a small direct subsidy program for individuals.

The rational for federal intervention in the housing market has revolved around the goal of providing all Americans with "a decent house in a suitable living environment". This has been defined as primarily improving the quality of the nations housing inventory by reducing the number of substandard housing units. In addition to improving the "minimum standard" of housing, goals have also been set to provide equal housing opportunity for all races and to stabilize the production of new housing (de Leeuw, 1974). These goals were set with a strong belief that there is a direct relationship between the quality of housing and the quality of life.

Economists have taken a different tact to justify government intervention in the housing market. They often claim that it is the presence of neighborhood effects, or the residential externalities which are a distinctive characteristic of the housing market, which justifies public intervention" (de Leeuw, 1974, p. 705) in the housing market.

Physical externalities, in which the value of one building is affected by the physical appearance of neighboring dwellings is the most frequent justification for imposing non-market minimum standards on the housing market. Of course the desire to protect occupants from hazardous conditions even if they are not externally

visible also motivates the attempt to eliminate substandard housing. An extention of the physical externality argument to the neighborhood gave rise to the whole set of urban renewal programs to eliminate urban blight (Jerome Rothenberg, 1967).

Social externalities also provide a strong justification for public intervention. According to Kain (1974) racial segregation, caused primarily by discrimination, and the distortion in metropolitan economic growth that it has caused, provides a strong theoretical justification for federal housing policy. Kain (1974) and Anthony Downs (1973) as a result strongly argue for a federal housing policy to open up the suburbs.

These economic justifications for intervention in the housing market must be contrasted with the view "that housing is primarily a private good, that substandard housing conditions are largely the result of poverty, and that existing housing policies are inefficient and inequitable" (Kain, 1974, p. 685). Proponents of this view would argue for a general income maintenance program rather than specific housing policies (Henry J. Aaron and von Furstenberg (1971), Aaron (1972).

Despite the appeal of this last argument, U. S. housing policy over the past five decades has generally relied on a set of supply side policies. Policies have attempted to

increase the supply of housing through the construction and operation of public housing and through subsidizing the private sector building of low and moderate income housing. The latter implicitly relied on a policy of filtering, whereby building in higher income sub-markets was assumed to allow the existing stock to filter down to low-income households (Lowry, 1961; Wallace Smith, 1971). More recent attempts to subsidize new construction have been found equally expensive and inefficient at meeting the needs of low and moderate income households (Arthur P. Solomon, 1974; and Henry Schechter, 1973). The major rental construction program for low income households in the past decade, has been the Section 8, New Construction and Substantial Rehabilitation Program. Section 8 New Construction has also been critized as extremely expensive, costing the government twice as much as comparable private rental accomodations (Wallace, et.al, 1981). Section 8 has also created substantial horizontal equity problems as only a small number of eligible households obtain this large subsidy.

The oldest supply side program, public housing, is a joint federal-local program. Public housing is developed, owned, and operated by local government. Until 1969 the Federal government only paid the capital costs of the project by funding the interest and amortization on 40 year

housing bonds. Since 1970 the federal government has paid an increasing share of the operating expenditures, with the "tenant contribution" being restricted to 25% of income (recently raised to 30% of income). These operating subsidies amounted to $174 per month per unit in 1981 (President's Commission, 1982, p. 32). This subsidy level is not suprising given that the average income of a tenant in public housing is 28% of the national median family income. Increasingly, public housing is for households who have special difficulty locating housing in the private market - single parents, minorities (59% of tenants), single elderly (36% of tenants) and large poor families. While one quarter of public housing projects are experiencing serious problems and conform to the image of high rise buildings occupied by tenants with social and economic pathologies, most projects are considered highly desirable by tenants, experience low vacancy rates, and waiting lists (R. L. Bish, 1969; Aaron, 1972; George Schermer, 1968). Despite several well publicized failures, in comparison to other supply side policies public housing has been far better targeted and cost efficient.

In contrast to these supply subsidy approaches there has been substantial support by economists for either a general income maintenance subsidy or a specific demand side subsidy for housing. In 1970, the Experimental

Housing Allowance Program (EHAP) set up an experimental demand side subsidy program. The program provided cash subsidies to households to assist them in securing adequate housing. Three types of experiments were conducted to test: 1) the affect of such a subsidy on the suppliers of housing and the price of housing (The Supply Experiment), 2) participation rates in the program (The Demand Experiment) and, 3) the response of households to different payment formulas, benefits levels, and required minimum housing quality standards (The Demand and Administrative Experiments). Twelve geographic locations were choosen for the experiment and over 30,000 households participated.

The findings indicate that nearly all of the allowance payments were spent on non-housing goods and services. Only those who could satisfy the minimum quality standards with a minimum expenditure participated in the program. If a major expenditure or a move was required, participation was low. Only 40% of households in the metropolitan area eligible for payments received them. Participation was especially low among the neediest households. The supply experiment indicated that EHAP failed to stimulate major improvements in the quality of the housing stock. The low participation rates and limited duration of the program probably contributed to a lack of any observable market wide effects in terms of price inflation or stock

conversion and rehabilatation. Also, the small percentage of poor households who participated in the experiment make it hard to generalize the results to a comprehensive housing allowance. Probably the strongest conclusion that arises from the behavorial results is that housing allowance recipients where possible treated their payments as a general income maintenance program (W. L. Hamilton, 1979; Stephen D. Kennedy, 1980; Lowry, forthcoming; Raymond Struyk and Marc Bendick, Jr., 1981; and Katharine L. Bradbury and Anthony Downs, 1981).

SECTION VII. CONCLUSION

Despite hundreds of papers and scores of books, housing economics remains a field with many unresolved research questions. Changes in the structure of the housing finance system, the emergence of housing as a major investment asset and the continued importance of housing policy all provide substantial avenues for future research. Housing researchers are also fortunate in having large bodies of public data collected during Census years for all metropolitan areas and on a three year basis for over sixty metropolitan areas. The wide range of unresolved issues, the unique characteristics of housing, and the abundance of easily accessible data assure a continued flow of academic and policy research in the area.

FOOTNOTES

1. This assumes economies of scale in the information process that enables brokers to reduce total search costs.

2. Although the importance of this refinancing costs has increased in recent years with the sharp increase in interest rates, the non-enforcibility of due-on-sale clauses in a number of states has potentially offset this increase.

3. This is true at least for cross section studies such as de Leeuw and Ekanem, who also allude to this possibility.

4. Although homebuilding does utilize approximately 40 percent of the output of the lumber and wood products industry, especially softwood, and some trade skills are in relatively short supply overall.

5. A more dynamic approach in the long run recognizes that these constraints raise prices and create demand backlogs which induce pressure for changing controls or providing

additional public services to increase the accessability of lower priced residential land.

6. All households may defer taxes on capital gains from the sale of the owner-occupied house by purchasing another house of the same or greater value within two years of sale date. In addition, long time owner occupants over age 55 are exempt from taxation on the first $125,000 of capital gain.

7. Although one can view t as a payment for government services related to the house and not a cost of housing, we incorporate it here as a cost of housing services.

8. Note that $E = PH - M$, so that $iE + m = iph$ if the mortgage interest rate is i.

9. In the case of existing homeowners with fixed rate mortgages, an unanticipated increase in inflation causes the actual decline in the user cost to income ratio to be even greater since the increase in interest costs pertains only to homeowner equity.

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