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SHELTERING THE URBAN POOR
The Need for Local Flexibility in National Housing Policy

by

Raymond J. Struyk, Sue A. Marshall
and Larry Ozanne

with contributions by
Michael S. Owen

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THE URBAN INSTITUTE
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Abstract

This paper presents analyses of the long-term direct and indirect effects of a number of housing programs implemented in a wide range of metropolitan housing markets. Emphasis is given to changes in the housing situation of low-income households, but the consequences for other groups and for the condition of the base year housing stock are also considered. The analyses are largely based on simulation results obtained using the Urban Institute housing market model for the 1960-70 period. Hence, the findings contrast the actual 1970 situation with the situation which would have existed had a particular program been in effect during the decade of the 1960s.

Greatest attention is given to the Section 8 Housing Assistance Program. In-depth analysis is also provided of a general capital subsidy for newly constructed dwellings and of the effects on housing of a major welfare reform. The consequences of several other programs are contrasted with those of the programs already noted. These include construction of additional conventional public housing, capital subsidies targeted on newly constructed dwellings providing a moderate level of housing services, a housing allowance, and housing allowances combined with either a targeted capital subsidy for new dwellings or a capital subsidy for rehabilitating existing dwellings.

Projections of the metropolitan housing situation in 1980 are also presented, based on forecasts exogenous to the model of the 1980 household income distribution, the trend in the prices of housing inputs over the decade, and trends in the size and demographic composition of cities. Estimates are made of how the 1980 situation would be changed by the operation of a large Section 8 Housing Assistance Program over the decade.

We draw three broad conclusions from the policy analyses conducted. First, the conditions present in the individual metropolitan housing markets do indeed have a strong impact on the effectiveness of housing programs in improving the housing situation of lower income households and in preserving the housing stock.

Second, use of a mix of demand stimulating actions in the form of restricted or unrestricted cash transfer and actions directly or indirectly making more dwellings of suitable quality available to lower income households will generally be more effective than exclusive reliance on either demand or supply augmenting programs. This implies considerable merit in the Section 8 Housing Assistance Program. In the event that a major welfare reform were enacted which increased the demand for housing, then a strong case can be made for complementary modest subsidies to suppliers to relieve market pressures. In the slower-growing markets especially, this would increase the effectiveness of welfare reform in improving the housing of lower income households.

Third, the best program appears to be one which would allow the mix between programs augmenting the supply of dwellings in the critical quality range and those fueling housing demand to vary locally. The argument for local determination certainly has merit, given the predominance of knowledge of immediate problems in the housing markets at that level. On this ground, the Section 8 Program with its locally prepared Housing Assistance Plans appears to be highly desirable. It remains to be seen if the promise of this program can be realized.

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Chapter 1

The Diversity of Housing Policy Outcomes

In the past decade enactment and implementation of national initiatives in urban housing to assist lower-income households have often produced intense and somewhat bitter debate about their consequences. In part, this dialogue reflects the differing viewpoints about how commonly agreed upon objectives should be achieved. Some of the debate, however, has been caused by a lack of understanding of the ultimate consequences of a specific policy. This ignorance is shared by the Congress and the Administration, by those in academia and research institutions who advise government officials, and by representatives of various advocacy groups.

To appreciate the reason for the lack of understanding and to gain an impression of the kind of information which is needed to overcome it, consider a potential Federal program to subsidize the construction of apartments for moderate income households. In particular, consider the reasons for supporting the program. Helping the building industry--especially in those periods when there is substantial excess capacity--is one of the primary objectives of U.S. housing policy; and strong support should come from this quarter.

Arguments on behalf of improving the housing of the poor or helping blighted neighborhoods are much more equivocal. Some might argue that the poor would be better served by focusing a program directly and exclusively on them, if they thought this possible. Such position might be countered, however, by those from metropolitan areas characterized by an ample supply of decent housing for poor households available, or possible with modest

improvement to some dwellings already built. Production of additional moderate income housing in such cities could conceivably cause an excess supply of housing available to the poor as the dwellings formerly occupied by those who move into the new housing are inhabited by lower income households and their former dwellings are freed. The process of shifting the housing stock to lower income households will, in a fixed demand situation, have the ultimate effect of creating an excess supply of the lowest quality dwellings. The potential result is a serious abandonment problem. Opposition to the program, then, may be an opposition to reducing the quality of the living environment of many of the poor who reside in those neighborhoods where abandonment would be most likely and, more generally, to deterioration of a portion of the city as a residence and work place.

At the same time support for subsidizing moderate-income housing could come from those cities characterized by a shortage of decent housing available to the poor, which often results from high levels of in-migration. With an increasing number of households at all income levels the market process by itself would not supply a sufficient number of dwellings to the poor, especially since (in the absence of subsidies) local building codes prohibit the construction of dwellings affordable by the poor. "Filtering"--the process by which dwellings are passed to lower income occupants--made possible by the shifting of the moderate income households to the subsidized units holds the very real prospect of relief for the poor.

This highly simplified example amply demonstrates the grounds for heated arguments, but also woven into it are several important facts germane to understanding housing markets. One is the importance which the indirect effects of government programs can have. A second is that these indirect effects can be anticipated to vary sharply with the conditions in individual metropolitan areas. In the illustration such conditions included

the size of the poor population relative to the number of dwellings available to them, the anticipated growth in the poor as well as other households, and the extent to which dwellings were likely to be "filtered" to the poor.

A third point is that the size of the program will be critical: different markets can absorb efficiently only certain amounts of the subsidized housing; that is, the introduction of a large enough quantity of such housing will produce dislocations in any market, including abandonment of still-serviceable structures. Finally, the example also suggests the enormous differences between a long-run and short-run perspective, where the long-run begins in 2-4 years after the program is operating. In the short run, the visible outcomes of the illustrative program would be construction of the new units and possibly the demolition of existing housing to provide building sites. Over the long-run the effects of shifting the balance between the demand for and supply of housing at various quality levels becomes apparent and potentially significant.

We have reasonably good information on the direct, short-run effects of housing policies. But we know very little about their long-run direct and indirect effects in different types of metropolitan areas. We know in a general way that the broad national strategy of keeping interest rates low and making mortgage funds available through government insuring operations encouraged new construction in the immediate postwar period and beyond. We also know that such building coupled with income growth, had, by the mid-sixties, produced a major upgrading in the quality of housing occupied by low as well as by high income households.[1] But

[1]For a general discussion, see Sections I and IV of F. deLeeuw, A. Schnare, and R. Struyk, "Housing," in Wm. Gorham and N. Glazer (eds.) The Urban Predicament (Washington, D.C.: The Urban Institute, 1976). A more detailed analysis for Boston and Pittsburgh with special reference to the effects of new suburban construction on the housing occupied by blacks is given in A. Schnare and R. Struyk, "An Analysis of Ghetto Housing Prices Over Time," Paper presented at the National Bureau of Economics Research Conference on the Economics of Residential Location and Urban Housing Markets, May 1975. Finally, the general idea of the filtering strategy is discussed by A. Downs in his "Housing the Urban Poor: The Economics of Various Strategies," American Economic Review, September 1969, pp. 646-51.

there has been no systematic tracing through of the differences in these effects in different types of urban areas. Likewise, the full effects to date of the subsidized homeownership and rental building programs aimed at moderate- and low-income families enacted in 1968 have not been documented.[2]

Recent legislation only increases the sense of urgency for this type of analysis. The Housing and Urban Development Act of 1974 has attempted to shift to metropolitan or other Local Housing Authorities the responsibility for deciding the best way to meet the housing needs of the poor in each area. Under the so-called Section 8 program the local Authority is to select its own mix of new construction, rehabilitation, and existing units to lease with Federal funds allocated to its area. Local groups, even with their intimate knowledge of conditions in the area, are often unable to comprehend fully the long-run effects of alternatives mixes. Clearly, analyses of the type described in the previous paragraph could be an important element in their allocation decision, and it is an element of guidance which they are actively seeking.

The main reason more such analyses have not been completed is the enormous difficulties which they entail, on both conceptual and operational grounds. This is not to say, however, that we cannot raise our level of understanding. One approach is social experimentation. The Department of Housing and Urban Development is sponsoring a large scale, extensive implementation of a prototype of a national housing allowance program in a dozen cities principally to

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[2]These are the programs enabled by Sections 235 and 236 of the National Housing Act, as amended. The immediate consequences of these programs have, however, received considerable attention. Two examples are (1) U.S. Department of Housing and Urban Development Housing in the Seventies: National Housing Policy Review (Washington,D.C.: U.S. Government Printing Office, 1974) Chapter 4; and (2) A. Downs, Federal Housing Subsidies: How are They Working? (Lexington, Mass.: D.C. Health and Co., 1973). The best empirical analysis of the indirect effects of government programs may be that for urban renewal. For a summary review of the experience over the life of urban renewal as such i.e., 1950-1973, see the report by the Real Estate Research Corporation to the U.S. Department of Housing and Urban Development, The Future of Local Urban Redevelopment (Washington,D.C.: U.S. Government Printing Office, 1975). An analysis of the early phase of the program, urban large-scale demolition was common practice, as in Martin Anderson, The Federal Bulldozer (New York: McGraw-Hill, 1967).

study the full effects produced by introduction of an allowance program.[3]

In this volume an alternative approach is taken to analyzing the full market effects of a series of potential programs. The vehicle of analysis is the Urban Institute Housing Market Simulation Model, a model of ten-year change in housing quality and household location in a metropolitan area. Using exogenous information on the beginning-of-period housing stock and the end-of-period households, the model determines the level of housing consumption of various types of households, the amount of new construction, and the extent of vacancies and abandonments. Because of its simplicity and low cost compared to social experiments, it has recently been used to study a range of government housing policies. Importantly, the model focuses attention specifically on the two areas of complexity where information is most lacking: the differences in policy effects among metropolitan areas and the differences between short-run direct effects and the long-run direct plus indirect effects. Further, the model is designed to capture the effects of governmental or private actions on the housing situation of households differentiated by race, income, or family type (e.g., nonelderly families vs. single individuals).

This volume is about housing policies in U.S. housing markets; it is not an exposition of an analytical tool, although an overview description is necessarily provided in Chapter 2 along with a description of the cities used in the policy simulations.[4] In Chapters 3 and 4 we examine the effects of a series of possible government policies primarily on how well the poor are housed, but also the consequences for other households and the housing stock: (1) consumer-subsidies under the recently enacted Section 8 program which are paid by Local Housing Authorities to owners of new units or existing dwellings

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[3]For an overview of these experiments, see U.S. Department of Housing and Urban Development Housing Allowances: The 1976 Report to Congress (Washington, D.C.: U.S. Government Printing Office, 1976).

[4]A full description of the model is provided in F. deLeeuw and R. Struyk, The Web of Urban Housing: Analyzing Policy with a Market Simulation Model (Washington, D.C.: The Urban Institute, 1975).

under contracts of varying length; (2) capital subsidies for new residential construction; and, (3) a general system of direct cash transfers to households (not earmarked for housing) like that which would result from a major reform of the current welfare system. In the fifth chapter we use the model to project the housing situation in selected metropolitan areas in 1980; these projections are of particular interest in light of the sharp increase in housing costs relative to incomes in the first half of the present decade. The final chapter presents an overview of the effects of 10 alternative housing programs including those analyzed in the earlier chapters, and attempts to point out which programs would make the most sense in different types of metropolitan areas.

Before turning to the policies themselves, however, it is essential for the reader to understand two key points: (1) the diversity of U.S. housing markets, and (2) the way in which these markets operate to produce indirect effects in response to government intervention. To this end the next two sections succinctly state the fundamental points in each area.

The Variety of Urban America

Everyone has mental images of diversity in urban America: the Gold Coast of Chicago, Hough in Cleveland, the sprawl of southern California. While these images can be valuable, we want to describe some particular contrasts among the approximately 250 Standard Metropolitan Statistical Areas (SMSAs) in factors determining housing quality. In this section differences among areas are documented; in the next we examine how these differences affect or are affected by various housing policy thrusts.

Fifteen indicators of housing in metropolitan areas have been compiled in Table 1.1 for a random sample of forty SMSAs stratified by population size. Three aspects of housing are covered: spatial structure, housing demand, and

Table 1.1
Indicators of Metropolitan Housing Market Diversity
(data for 1970 unless otherwise noted)

Indicator	Population size category[a]							
	Over 2 Million		1-2 Million		500,000-1 Million		50,000-500,000	
	Maximum Value	Minimum Value	Maximum Value	Minimum Value	Maximum Value	Minimum Value	Maximum Value	Minimum Value
A. Spatial Structure								
1. Population	11,571 New York	2,070 Baltimore	1,984 Houston	1,064 San Jose	916 Columbus, O.	529 Jacksonville	413 Fresno	65 Midland
2. Population Density (persons per sq. mile)	5,419 New York	788 Pittsburgh	2,654 Newark	314 Dallas	691 Jacksonville	234 Sacramento	1,076 New Bedford	69 Fresno
3. Percent of dwellings in one unit structures	73 Philadelphia	28 New York	74 Houston	47 Newark	81 Youngston-Warren	62 Syracuse	86 Midland	46 New Bedford
4. Percent of population black	24 Baltimore	4 Boston	19 Houston	2 San Jose	23 Jacksonville	4 Syracuse	28 Augusta, Ga.	1 Lowell
B. Housing Demand								
5. Median family income ($)	12,112 Detroit	9,729 Pittsburgh	12,453 San Jose	10,129 San Diego	11,965 Rochester, N.Y.	7,473 Columbus, O.	10,934 Lowell	8,199 Knoxville
6. Percent of Households in Poverty	9.3 New York	6.1 Boston	9.8 Houston	4.6 Minneapolis-St. Paul	14.1 Jacksonville	5.2[b] Rochester, N.Y.	17.4 El Paso	6.1[b] Des Moines
7. Percent of dwellings Owner-occupied	72 Detroit	37 New York	70 Denver	53 Newark	75 Youngstown-Warren	59 Columbus, O.	74 Midland	54 New Bedford
8. Percent Change in families 1960-70	22.2 Los Angeles	-0.1 Pittsburgh	65.6 San Jose	4.7 Milwaukee	27.8 Sacramento	4.4 Toledo	40.7 Gainsville, Fla.	0.0 Midland
9. Percent Change in low-moderate income families, 1960-70[c]	5.1 Los Angeles-Orange	-23.5 Detroit	24.7 San Jose	-17.0 Milwaukee	27.9 Jacksonville	-18.1 Youngstown-Warren	15.3 Gainsville, Fla.	-17.2 Des Moines
10. Percent of Population 65 yrs. & over	11 Boston	8 Baltimore	10 Newark	5 Houston	10 Rochester, N.Y.	7 Sale Lake	13 New Bedford	5 Midland
11. Mean Population Per Household	3.3[b] Baltimore	2.9[b] Los Angeles	3.3[b] San Jose	3.1 Denver	3.5 Salt Lake	3.1 Sacramento	3.7 El Paso	3.1 Roanoke
C. Housing Stock								
12. Percent of structures built in 1960-70	25 San Francisco Oakland	14 Boston	49 San Jose	17 Newark	36 Sacramento	19[b] Toledo	47 Gainsville, Fla.	10 New Bedford
13. Percent of structures built prior to 1950	72 Boston	45 Los Angeles-Orange	64 Newark	21 San Jose	62 Toledo	31 Sacramento	78 New Bedford	22 Midland
14. Rental Vacancy Rate	7.9 Detroit	2.2 New York	13.2 Seattle-Everett	2.9 Newark	11.5 Jacksonville	4.6 Sale Lake	15.5 Midland	3.2 New Bedford
15. "Fair Market Rent" of 2 bedroom apartment, 1975 [d]	241 New York	178 Pittsburgh	231 San Jose	170 Houston	210 Rochester, N.Y.	160 Jacksonville	216 Lowell	127 Beaumont-Port Arthur

[a]The areas included in each group are: (1) largest - New York, Los Angeles, Chicago, Philadelphia, Detroit, San Francisco-Oakland, Boston, Pittsburgh, Baltimore; (2) 2nd - Houston, Newark, Dallas, Seattle-Everett, Milwaukee, San Diego, Denver, Indianapolis, San Jose, Minneapolis-St. Paul; (3) 3rd - Columbus (Ohio), Rochester (N.Y.), Sacramento, Toledo, Syracuse, Salt Lake, Youngstown-Warren, Jacksonville; (4) smallest - Fresno, Knoxville, El Paso, Beaumont-Port Arthur, Des Moines, Augusta, Lowell, Roanoke, Lubbock, New Bedford, Ogden, Gainsville, Midland

[b]More than one city with the maximum or minimum value

[c]Defined as 1970 households with incomes of $10,000 or less compared to 1960 households with incomes of $7,000 or less.

[d]The Fair Market Rent is the market rent defined by the Department of Housing and Urban Development for units to be leased under the Section 8 housing program. Such rents are defined for various sized units, all of which must meet certain quality standards.

Sources: U.S. Bureau of the Census, County and City Data Book, 1972 (Washington, D.C.: U.S. Government Printing Office, 1973). U.S. Bureau of the Census, Census of Housing: 1970 Metropolitan Housing Characteristics, HC(2) Series, and U.S. Census of Housing: 1960, Vol. II, Metropolitan Housing (Washington, D.C.: U.S. Government Printing Office, 1973 and 1963). Federal Register, Vol. 41, No. 30, February 12, 1976 (Washington, D.C.: U.S. Government Printing Office, 1976).

the stock of housing. The cities, listed in the notes to the table, have been divided into four groups based on population size for comparison in order to emphasize the diversity present even among cities of roughly similar size.

The first set of indicators is of spatial form. Population density and the percentage of dwelling units in one-unit structures are closely related and provide a rough-and-ready measure of city form. The percentage of the population that is black is included in this category because the continuing pervasive residential segregation in American cities has the ultimate result of constraining residential location choices of both white and blacks and often increasing intraurban travel time.[5] All of these measures show enormous variance within each size category: population density ranges in the second group from 314 persons per square mile in Dallas to 2,654 in Newark; among the smallest SMSA's, 1 percent of Lowell's population is black compared to 28 percent of Augusta's.

The second set of indicators is of housing demand. Variation in median family income levels and in the percentage of households below the poverty line suggests the actual degree of poverty.[6] As we shall see later, a very important demand factor for differentiating SMSAs is the growth of the total number of households and the growth in low-to-moderate income households in particular. The percentage changes for families for the 1960-70 period (shown in indicator items 8 and 9) do indeed demonstrate an enormous range. Both

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[5] On the extent and persistence of residential racial segregation in American cities, see A. Sorensen, K.E. Taeuber, and L. J. Hollingsworth, Jr., "Indices of Racial Residential Segregation for 109 cities in the United States, 1940 to 1970" (Madison: The Institute for Research on Poverty, University of Wisconsin, 1974), and deLeeuw, Schnare, and Struyk, op.cit., Part III, pp. 145-55.

[6] They are only suggestive because of interregional price differences which are not controlled for in these income figures.

San Jose and Milwaukee are in the 2nd largest set of cities. San Jose grew by 66 percent overall and low-to-moderate households also grew by 25 percent. Milwaukee, by contrast, grew by only 5 percent overall, while the number of low-to-moderate families declined by 17 percent. Such differences have obvious implications for the relative demand for lower quality housing.

The final set of indicators is of housing stock and the availability of housing relative to demand. The percent of units built 1960-70 and before 1950 (variables 12 and 13) provide some idea of the vintage of the stock. Note that the percentage of the 1970 stock built over the prior decade is in no case less than 10 percent regardless of the growth rate in the number of households. The demand for new housing stems from income growth and from the depreciation of the existing stock as well as from population growth; nevertheless substantial new construction in the face of little growth in the number of households signals a potential excess supply situation in certain housing quality ranges. The rental vacancy rate and the "fair market rent" of a two bedroom apartment as estimated by HUD are included under the supply heading, although both obviously result from the interaction of demand and supply forces. Again, the range of differences in these variables among comparably-sized cities is striking.

Urban American housing markets are diverse, and to some degree each is unique. On the other hand, as we shall see in the next section and in Chapter 2, it is possible to group metropolitan areas on the basis of a few factors which strongly affect housing policy outcomes.

The Workings of the Urban Housing Market

Having noted the diversity of American cities, what difference does it make? Even the casual observer is struck by the variation in the cost of equivalent housing both between and within cities. Why is it that even after

controlling for regional price differences housing is cheaper in some cities than others? Why are there conspicuous differences by race in the cost of equivalent structures within the same city? Why is there abandonment in one city but not in another when both cities are in many respects similar?

The answers to such questions have to do in part with the character of housing itself. One characteristic which distinguishes housing from most other goods is its durability. Durability refers not only to the fact that a structure lasts a long time--probably 50 years or more--but that it is comparatively inflexible, meaning difficult and costly to modify, once it has been built. An important consequence of this inflexibility is the slow and typically small increase in housing services produced in response to increased demand. A second characteristic which distinguishes housing from other consumer goods is its immobility and, hence, the association of a set of neighborhood conditions with each dwelling. Among the neighborhood characteristics are the racial and socioeconomic status of the inhabitants, the condition of other dwellings, the presence of amenities like parks, and the quality of public services, especially schools. The individual property owner exercises little influence over his neighborhood environment. At the same time, though, households have definite preferences for the types of neighborhoods and dwellings, preferences strong enough that they are willing to pay premiums to get the "housing bundle" they want.

These two characteristics--durability and strong household preferences for neighborhood characteristics--make it possible for there to be a series of closely related yet distinct housing submarkets within a metropolitan housing market. On the durability side, there is the possibility of an excess

supply or a shortage of dwellings of a particular quality to exist for some time, i.e., until dwellings are modified to correspond to demands. On the neighborhood side, similar demand-supply imbalances occur. These conditions create the possibility for some dwellings to command a differential price per unit of housing service. Since the concept of the "price per unit of housing service" is a fundamental one, let us consider it carefully.

To begin, we must think of an index of all of the housing services which a dwelling provides. It provides interior and exterior space, with the interior space described in terms of the condition of the walls, ceilings, and floors. A dwelling also provides a variety of services from its major mechanical systems--water, heat, sanitary facilities--and these can be further described in terms of their adequacy and dependability. While our list could be expanded, the notion of cataloguing the services which the dwelling provides is clear. It follows that two dwellings providing the same total quantity of services could have different amounts of space, heating adequacy, and so forth. Assume that we could construct quantity indices which combine all these service flows into a single number (and in practice, we can do so to a limited degree). Further, if we divided a dwelling's rent (the product of quantity and price) by our quantity of housing services figure, the result would be the price <u>per unit of housing services</u>.

When submarkets were mentioned previously, they really referred to the situation in which the price per unit of housing services varied systematically among dwellings because of demand-supply imbalances for dwellings providing alternative quantities of housing services (durability) or because they were located in different neighborhoods. It is the segmentation or the

splitting of the housing market which is a key to answering the questions about rent and price differences posed at the beginning of this section.

An example may help to clarify the origins of price differences which stem from the durability or inflexibility of housing. Imagine a market in which there are only two kinds of housing, modest houses providing 100 units of service a month (as measured by our index) and luxury houses providing 200 units of service a month. Furthermore, suppose that the initial distribution of family incomes is such that the proportion of families choosing luxury houses over modest houses is just the value which keeps the prices per unit of service in these two types of dwellings equal.

Then, suppose that with the passage of time incomes in the community grow and cause the demand for luxury houses to grow. In the short run the market would respond to this shift in demand by a rise in the price of luxury houses relative to modest houses. Eventually construction of new luxury houses and withdrawal of modest houses from the stock when they were no longer profitable could restore price equality; but in the interim families occupying modest houses would be getting a bargain in the price they pay per unit of housing services. Hence, because of their "durability" the modest quality dwellings could not be upgraded at a cost competitive to new units. Thus an excess supply of these units is created which drives their price per unit of service down--down faster than services decline in the short-run.

Rising incomes, then, can lead to price benefits for lower-income households. It is easy to imagine other changes which would leave consumers of modest houses worse off. For example, migration of a sizable number of low-income families into a housing market might raise the demand for low-quality housing (i.e., units providing a small quantity of services) sufficiently to cause it to sell at a premium. Again there are forces at work tending to restore price equivalency per unit of services in different kinds of houses: at high enough prices

dwellings will be transferred from higher to lower income households or new dwellings built. But the forces moving prices away from equivalency can be stronger than the forces moving them toward it for extended periods of time due in large measure to the inflexibility of existing housing. The case of an increase in demand for dwellings providing few services is particularly problematic. Again, price equality cannot be restored until more dwellings become available to the low-income market. But in most cities and suburbs of the United States there is a fairly stringent regulation of the quality of newly built dwellings so that increased supply through construction of new dwellings for poor people is effectively prohibited. The only remaining source of increased supply, depreciation of higher-quality existing dwellings, can be a very lengthy process.

These dynamic forces, in conjunction with strong household preferences and temporarily limited supplies of certain dwelling-neighborhood bundles, continually act in the direction of creating price differences among neighborhoods or among particular types of structures. And there is no reason to expect the pattern of price differences to follow the same pattern in every city.

Perhaps the most effective way to demonstrate the potential for price premiums and discounts is to examine the changes in four widely diverse metropolitan areas over the 1960-70 period. Table 1.2 presents data on two slow growing (Chicago and Pittsburgh) and two fast growing (Austin and Washington, D.C.) areas. In all four areas the net increase in dwelling units and households are comparable. In the slow growing areas, though, there were substantially more new units built than new households formed; and there were major declines in the number of poorest households. Since households moving into new dwellings vacate their former dwellings, the supply of dwellings providing a lower quantity of services rises sharply relative to

Table 1.2

Indicators of Demand and Supply for Dwelling Units in Selected Metropolitan Areas

Indicator	Metropolitan Area			
	Slow-growing		Fast-growing	
	Chicago	Pittsburgh	Austin	Washington
Percentage change, 1960-70 in number of				
households	15.0	6.9	53.6	52.1
dwelling units	15.3	7.0	56.5	47.1
Ratio: Percentage of 1970 units built 1960-70 to the percentage change in households 1960-70	1.40	2.11	.83	.72
Percentage change 1960-70 in the number of households with incomes under $4,000	-19	-20	-9	-13

Source: U.S. Bureau of the Census, Metropolitan Housing Characteristics, 1960 and 1970 Census of Housing (Washington, D.C.: U.S. Government Printing Office, 1962 and 1972).

demand; and this decreased the prices of these dwellings. The lower prices allowed lower income households to occupy these units while vacating their own. This process continued until the worst quality housing was permanently vacated or converted to other uses, but competition was such as to keep prices depressed. Of course, the extent to which the price per unit of service of dwellings of this type was depressed varied by neighborhood conditions, including racial mix, employment access, and public service factors.

In Washington and Austin, on the other hand, new construction did not keep pace with household formation over the 1960s; this led to reduced vacancies and promoted the conversion of existing structures into more dwelling units. This circumstance combined with only a modest decline in the number of poor households (due to high rates of in-migration) presumably produced an excess demand and rising prices in all quantity-of-service submarkets. These prices did not necessarily imply high profits, though, as revenues had to be sufficient to cover the costs of converting and upgrading units.

The critical role played by the price per unit of service of newly constructed dwellings can now be appreciated in the general case. A large segment of the existing stock must be competitive with new housing, since many households have the option of purchasing or renting either new or existing dwellings. If the price per unit of service of new dwellings declines, more households select new dwellings; and their former units become available for other, less affluent households. On the other hand, a shift up in the price per unit of services of new dwellings causes the flow of dwellings to lower income households to be sharply reduced even in areas like Pittsburgh and Chicago, because higher income households are more likely to remain in their current residences. This situation can lead to market-wide increases in the price of housing and even absolute shortages for the lowest income households who

might, at the extreme, be forced to double-up. Thus these indirect market effects of higher new construction costs can effect the housing situation of many more households than the direct consequences experienced by purchasers of new homes.

Variation in the price per unit of housing service of existing dwellings and shifts in the price of new dwellings may also influence the costs and degree of residential racial segregation. In metropolitan areas with an excess supply of dwellings providing few services, the lower average income of black relative to white households can cause an especially deep depression in the price per unit of service of the dwellings in black enclaves. (The desire of households, both blacks and whites, to live with others of their own race might well lower prices further.) If the depression of prices is greater for lower quality dwellings than for moderate quality ones, then the cost to blacks of moving into better housing or a superior neighborhood will be greater than if no discounts existed. Periods characterized by a low price per unit of service for new units facilitates residential mobility by blacks (and the poor generally) by increasing the supply of available units and thus the increasing cost to individuals or landlords who refuse to sell or rent to blacks.

The main point, though, of this and the prior discussion is the sensitivity of prices paid by low income (often black) households to demand and supply conditions in the overall market. Indeed, the submarkets defined by the quantity of services dwellings provide, by neighborhood characteristics or by combinations of the two are all linked (a) on the demand side through the behavior of households in evaluating alternative housing-neighborhood price combinations and (b) on the supply side by suppliers of housing responding to shifts in demand as reflected in the prices they face.

* * *

The central point of the argument thus far is inescapable: The magnitude and type of indirect effects caused by a housing policy depend upon the conditions in the market at the time of implementation. Quite clearly the direct effects can be similarly dependent, as when no developers wish to participate in a building program for low income households because even with a subsidy the new units will not be competitive with existing units carrying a price discount. The effects of initial conditions on direct program operation are, though, much smaller than those on the indirect consequences of the program because the size of the incentives to local governments and individuals are usually structured to insure the degree of participation sought in the national program.

This brings us again to what is the central theme of this volume: For national housing policy to apply the same housing program in all urban markets is a mistake because of the vast differences in the direct effects produced by any major government program. The remainder of this book documents the need for greater program flexibility as required by the diversity of metropolitan housing markets in the United States.

Chapter 2

The Engine of Analysis and the Cities Analyzed

The Urban Institute Housing Market Model

The conceptual basis of the Urban Institute model is essentially identical to that outlined in the section on "The Workings of Urban Housing Markets" in Chapter One. In fact, it will be useful to think of model as converting the concepts described there into a quantitative formulation.

The model is able to analyze ten-year changes in the location of households and the price and quantity of housing services within a given metropolitan area. The ten-year time horizon reflects our strong conviction that the secular trends in real household income, the price of housing services relative to other goods, and the growth in the number of households and their expenditure patterns on housing are the forces which determine how well families are housed. The decade-period allows one to abstract from a host of shorter-term phenomena--the building cycle, rent strikes, temporary rent controls--and to focus on the more important elements. It also permits substantial simplifications in the model formulation.

A second important point is that the model is calibrated to individual metropolitan areas. Its predictions are, therefore, area specific; and one of its best uses is in applications to diverse areas. This focus sets the model sharply apart from other models which are national in scope, such as those predicting the level of housing starts.

The model operates at a fairly high level of aggregation: the urban area is typically divided into 4-6 zones; and the zones are defined so as to maximize within-zone homogeneity of the base year housing quality, travel times

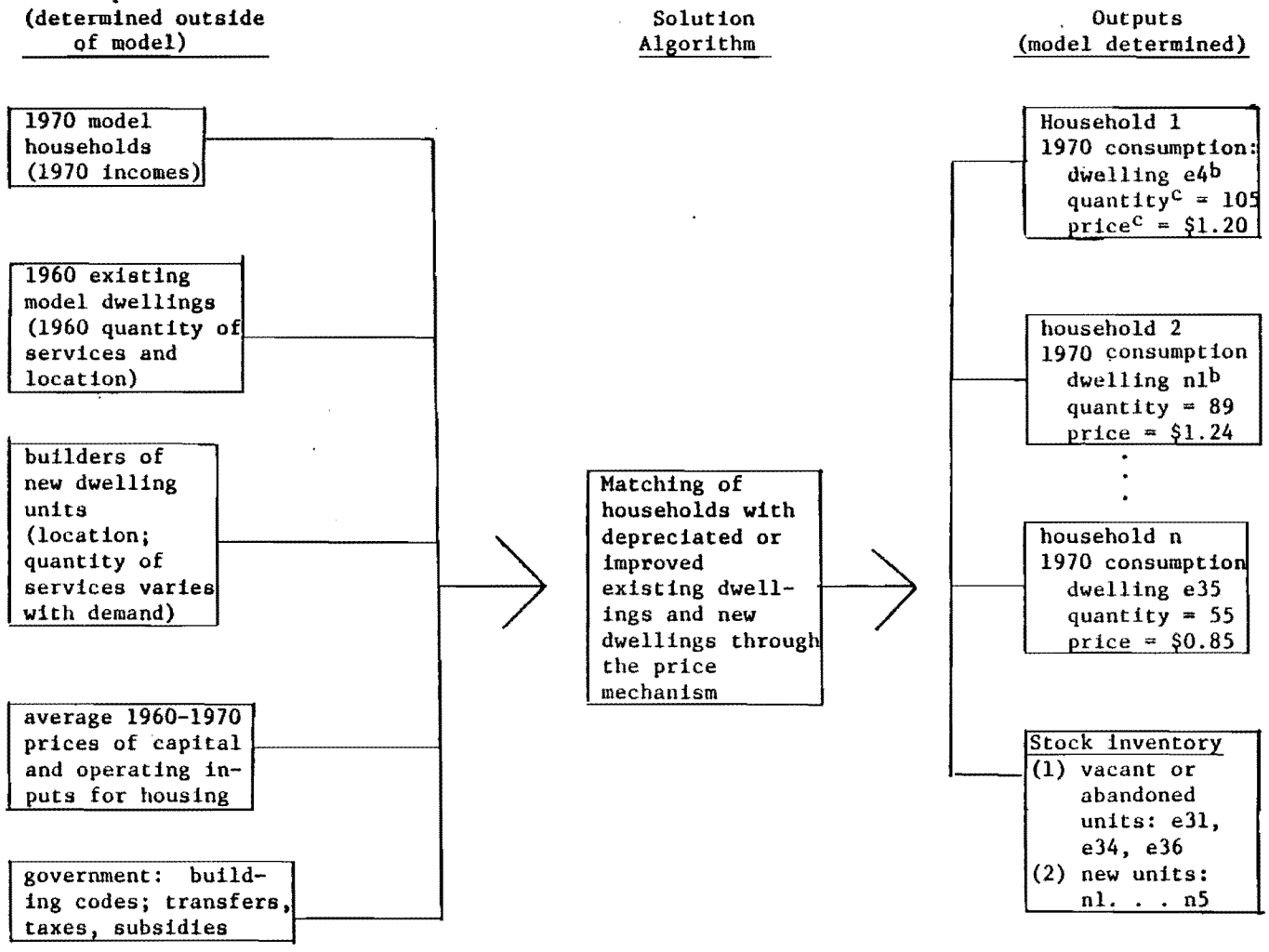
of workers living there, and the socioeconomic mix of the households. In addition, households and dwellings are divided into three or four dozen "model households" and "model dwellings," which are structured to reflect the income and quantity-of-housing service distributions of actual households and dwellings. Each dwelling in effect represents a housing submarket. The principal data inputs to the model are the number and incomes of households at the end of the period, the beginning-of-period housing stock, and the average-over-the-period prices of operating (e.g., fuel oil) and capital inputs (e.g., mortgage funds) used in producing housing. The main outcomes of the model are the prices and quantities of housing services prevailing at the end of the decade, the number of new units added to and the number removed from the stock over the period, and the location of households among zones.

Figure 2.1 gives a graphic presentation of the inputs to the model and the factors determined by it. The entries on the left-hand side of the figure are the inputs. These consist of the prices of inputs used in producing housing services and the characteristics and behavior of the following four groups or agents.

(1) model households - characterized by race, income, and whether they are families or individuals living alone. These are the consumers of housing, and their objective is to maximize their satisfaction by selecting to occupy that dwelling which they find most attractive, in terms of the services it provides, its price, and the neighborhood in which it is located. Housing demand is determined by the household's normal income and relative prices.

(2) landlords and existing model dwellings - landlords control the dwellings in the stock at the start-of-period, a stock characterized by its location and the quantity of services each dwelling initially provides.

Figure 2.1. Predetermined and Endogenous Factors in the Urban Institute Model



[a]location characterized by employment access (travel time) and racial-economic status of households at that location

[b]e4 refers to the fourth existing dwelling; n1 to the first new dwelling.

[c]price is the price per unit of housing services; quantity is the quantity of services per month.

Landlords are out to maximize their profits, and do so by following a schedule of price-quantity offers consistent with this objective.

(3) builders of new dwellings - new units are built on demand (i.e., at a constant price per unit of service implying an infinitely elastic 10-year supply). As part of the solution process each household considers living in a new dwelling which would meet its needs.

(4) government--can impose building code and similar regulations, levy taxes, and provide income transfers and price subsidies. The behavior of government, i.e., the determinants of its actions, is not included in the model.

The solution algorithm (in the center of the figure) matches end-of-period households with the beginning-of-period dwellings (depreciated or improved over the period) and new dwellings, with some beginning-of-period dwellings potentially abandoned. The solution process consists of households choosing dwellings and landlords responding to over-occupancy or under-occupancy by raising or lowering prices (and hence the amount of services provided); then households make new choices, and so on. A solution is reached when each dwelling unit has only one occupant and vacant units rents are so low that they are not being offered for occupancy by landlords.

There are several types of outputs, then, as shown in the right-hand panel of the figure. For each model household one knows the price per unit of service paid and the quantity of services consumed. By comparing end-of-period services with those at the beginning the progress in improving housing can be monitored; it can be further monitored for certain types of households (e.g., the old, the poor) and for certain locations (e.g., central cities). Additionally, the amount of new construction and stock retirement is known.

The model makes use of conventional assumptions that households seek to maximize their satisfactions and that landlords seek to maximize their

profits. It does so, however, in a framework which emphasizes the characteristics which we argued earlier distinguish housing from most other goods: durability and neighborhood linkages. Durability enters through the detailed representation of the start-of-decade housing stock by quality and location. Neighborhood enters the model through the division of a housing market into zones whose characteristics--travel times, racial and socioeconomic characteristics of households living there--influence household choices.

Four fundamental assumptions underlie the basic structure of the model. The first is simply that households and landlords exhibit consistent, rational behavior so that the behavior of groups or actors--like our model households and the landlords of the model dwellings--can be adequately summarized in continuous functional relationships. Second, the consumption decision of households is assumed to be independent of the production decision of landlords. That is owner-occupants act like profit-maximizing landlords in deciding how much housing to provide themselves. Hence, there is no need in the model to distinguish between renters and owner-occupants.

The third assumption is that the housing market is competitive, meaning that no supplier can affect the price of housing services and that these services are allocated among competing potential consumers by a price mechanism. The final assumption is that it is possible for urban housing markets to be divided into submarkets for dwellings of different qualities in the sense described in the previous chapter, i.e., different prices per unit of service may prevail among these submarkets in the short-run.

Appendix A takes up each of the groups in turn and sketches the solution process, and the reader is referred there for a more complete but still simplified exposition. Some further conceptual discussion of the model is given in the next section in the process of describing the pattern of prices per

unit of service prevailing among quality submarkets in 1970 in the cities used later in analyzing the effects of housing policies.

The Cities Analyzed

Applications of the Model. The Urban Institute model has been applied to eight metropolitan areas for the 1960-70 period--Durham, Austin, Portland (Oregon), Pittsburgh, Chicago, Green Bay, South Bend, and Washington, D.C. These areas were chosen because of the enormous diversity they exhibited in several features that were thought to affect the functioning of a housing market, including SMSA size, the structural composition of the stock (e.g., single-family units), the rate of population growth, and the racial and economic composition of the population. The summary data for each of the above areas (Table 2.1) suggest the variety of conditions found in these areas.

One purpose of the applications has been to estimate five of the model's nine parameters, i.e., those numbers which quantify the behavior of households and landlords. The estimated parameters are those for which independent econometric estimates have not previously been done (including some for which such estimates are infeasible). Two of these were parameters of the landlord's supply function, i.e., the equation which shows how much landlords will change output in response to a change in demand. Satisfactory estimates for these parameters were not obtained through the applications.[1] As a consequence a pair of parameter sets which bracket the range of feasible values has been used whenever doing policy analyses or projections with the model. These two parameters sets

[1]Briefly, in the process of calibrating the model it is typical to obtain several alternative sets of supply function parameters which provide low error-of-fit. These sets, though, can imply quite different degrees of responsiveness to demand changes on the part of suppliers. The ultimate choice among the competing parameter sets as to which provides the "best" fit is often decided on the basis of small, and likely not highly important, differences in the goodness-of-fit criteria.

Table 2.1

Selected Data for the Eight SMSAs to Which the Urban Institute Model Has Been Applied

	Durham, N.C.	Austin, Texas	Portland, Oregon	Pittsburgh, Pa.	Washington, D.C.	Chicago, Ill.	Green Bay, Wisc.	South Bend, Indiana	All U.S. Metropolitan Areas
Number of occupied units (000's)	58	91	342	759	854[c]	2,182	44	76	43,859
Population density (per square mile)	274	296	276	788	1,217	1,876	302	308	360
Percent change in population 1960-70[a]	23	39	22	-0.2	38	12	26	3	
Proportion of occupied units:									
Occupied by black households	.25	.10	.02	.07	.23	.15	0	.06	.11
Occupied by Chicano households	[b]	.11	[b]	b	.02	.04	b	b	
In single-unit structures	.76	.71	.75	.72	.55	.47	.75	.83	.64
Occupied by owner	.54	.55	.65	.68	.46	.52	.73	.78	.59
Built 1960-1970	.37	.44	.27	.14	.37	.20	.27	.16	.25

[a]Corrected for annexations

[b]Data not available.

[c]Based on 1960 boundaries.

Sources: U.S. Bureau of the Census, County and City Data Book, 1972 (Washington, D.C.: U.S. Government Printing Office, 1973). U.S. Bureau of the Census, Census of Housing: 1970 Metropolitan Housing Characteristics, HC(2) Series, and U.S. Census of Housing: 1960, Vol. II, Metropolitan Housing (Washington, D.C.: U.S. Government Printing Office, 1973 and 1963). Federal Register, Vol. 41, No. 30, February 12, 1976 (Washington, D.C.: U.S. Government Printing Office, 1976).

are termed the elastic and the inelastic (or more responsive and less responsive) parameter sets in the following exposition; the term refers to the price elasticity of supply of housing services from the existing stock.[2]

Four Prototypical Cities. The simulations reported in this volume have been conducted for four prototypical metropolitan areas whose construction is based on the experience of calibrating the model to the eight actual SMSAs. First, the hypothetical cities could be designed so that between them they are representative of the entire population of U.S. metropolitan areas, whereas the eight actual areas are not. Second, we were able to design the hypothetical cities so that the differences between them are small in number and precisely identifiable, making it possible to generalize about how these differences in conditions influence the effects of housing policies or trends in key market factors.[3]

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[2]The price elasticity of supply is defined as the percentage change in housing services provided by a supplier in response to a 1 percent change in the price he is offered. The elasticity concept in the model refers to a 10-year period. The inelastic parameter set implies an elasticity of 0.5 and the elastic set a value of 1.2. These values bracket the relevant range found in the applications and are consistent with the small amount of econometric evidence available. It is perhaps worth emphasizing that these are the average values across all producers using the existing stock and they explicitly exclude housing services which are added through the construction of new units. References to econometric analyses of the elasticity of housing services are: F. deLeeuw and N. Ekanem, "The Supply of Rental Housing," American Economic Review, December 1971 pp. 214-26; and L. Ozanne and R. Struyk Housing from the Existing Stock: Comparative, Economic Analyses of Owner-Occupants and Landlords (Washington, D.C.: The Urban Institute, 1976).

A complete listing of the parameter values used in the simulations done here are reported in Chapter 6 of deLeeuw-Struyk, op.cit. The values for the first six cities to which the model was applied are given in Chapter 5 of the same reference; those for South Bend and Green Bay are in Sue A. Marshall, "The Urban Institute Housing Model: Application to South Bend, Indiana," and Jean Vanski, "The Urban Institute Housing Model: Application to Green Bay, Wisconsin," (Washington, D.C.: Urban Institute Working Papers 216-26 and 216-27, 1976).

[3]Each actual city, in contrast, differs from each other city in a multitude of complex ways, with the consequence that it is hard to know what might account for differences in policy results among actual cities.

Third, the four hypothetical cities could be designed so that they yielded model solutions relatively easily and efficiently. Finally, because the hypothetical cities are based on national data, it is possible to use various national projections made by the Census Bureau and others in estimating future values of the model inputs.

The four prototypical areas, designed to be representative as of 1970, vary in racial composition and in the growth rate of low- and moderate-income households. These two dimensions--identified in the process of applying the model to actual areas as strongly affecting simulation solutions--have important influences on housing policy outcomes. Racial composition is chosen because segregation is both a market characteristic of direct interest in itself and because it may prevent an efficient matching of households and dwellings. The growth rate of low- and moderate-income households is important because of its bearing on the emergence of excess supplies of low-quality housing and, hence, on differences in the price per unit of service for low-quality compared to other dwellings. Therefore, four cities were designed. The four cities have each been given a short-label which represents some distinctive aspect of the region of the country where most of the SMSAs it represents are located: (1) a high-minority rapid-growth area, labeled Cloth, for the border states and deep South; (2) a high-minority slow-growth area, labeled Steel, for the Industrial Northeast; (3) a low-minority rapid-growth area, labeled Far West; and (4) a low-minority slow-growth area, labeled Grain, for the cities of the Mid-West. Some characteristics of the four cities as of 1970 appear in Table 2.1, including the percentage of all SMSAs and of urban population each of them represent.[4] Note that for the actual policy simulations we will have 8 cases: four

[4]In Appendix B all of the Standard Metropolitan Statistical Areas in the United States have been classified into one of the four prototypical city types.

Table 2.2

Characteristics of Four Prototypical Metropolitan Areas

	City			
	Cloth High minority- rapid growth	Steel High minority- slow growth	Far West Low minority- rapid growth	Grain Low minority- slow growth
Minority households as a percent of total, 1970	20	21	5	6
1960-1970 Growth of Low-to-Moderate Income Households	+12	-3	-22	-3
1960-1970 Growth of All Households	+25	+7	+39	+13
Number of Model Households, 1960	31	31	31	31
Number of Model Households, 1970	40	33	43	35
Percentage of All SMSA's Represented by City	30	38	21	10
Percentage of Total SMSA Population Represented by City	20	26	25	28

prototypical cities and two supply elasticity assumptions for each.

The design of the four cities began with the construction of a joint distribution of (a) minority proportions and (b) growth rates of low- to moderate-income households (defined as difference between the number of 1970 households with incomes of $10,000 or less and the 1960 number of households with incomes of $7,000 or less). The distribution was constructed for a random sample of SMSAs weighted by population; in fact, this is the same sample of cities used in Chapter 1 to illustrate diversity. Each of the four prototypical cities represents one of the four quadrants of this joint distribution, i.e., each city's racial composition and growth rate are based on those of the actual SMSAs in the quadrant. Hence the four cities are in a sense representative of the nation's entire SMSA population.

The model households for each of the four cities were based on Census data on the distribution of incomes in all U.S. metropolitan areas. This yielded separate income distributions for the four household types distinguished in the model: (a) white nonelderly families, (b) white elderly households and white single individuals, (c) nonwhite nonelderly families, and (d) nonwhite elderly households and nonwhite single individuals. These groups were then weighted differently to construct the household populations of each of the prototypical cities.[5]

[5]By specifying the number of actual households per model household for each of the four household types, a relatively small number (30-45) of model households was then created with income distributions resembling those of actual households. The number of actual households per model household was varied among household types in order to obtain cities with the desired combination of growth rate and minority proportion.

For the high-minority cities a smaller number of actual households per model household was used for the two nonwhite household types than for the two white household types, while for the low-minority cities the reverse was done. For the high-growth rate cities a smaller ratio of actual to model households was used for all household types than was used for the low-growth cities; and since the number of existing dwellings is the same for all four cities, there is more pressure to utilize the existing stock fully and to build new dwellings in the high- than in the low-growth cities.

In all respects other than household characteristics, the four cities are identical for 1970. They have identical initial-year model dwellings, based on housing stock of all U.S. metropolitan areas in 1960. Specifically, there are 31 existing dwellings in 1960 for each of the four cities. Table 2.2 shows the number of households for each city in 1970. It would be possible, of course, to vary the initial stock among cities just as we have varied household characteristics. But since market outcomes depend essentially on household demands relative to the initial stock, varying household characteristics accomplishes much the same purposes as varying the initial stock.

The existing housing stock in each city is divided into five zones, similar to those defined in the model applications. The first four zones contain all of housing present at the beginning of the period. Zone 1 is a zone of relatively low housing quality and high minority proportion in the initial year; it represents the inner city of a typical metropolitan area. Zone 2 is the area of higher housing quality within the central city. Zone 3 and 4 are suburban zones, with Zone 3 containing a high proportion of high-quality stock.[6] The fifth zone is the zone of new construction, the location of all of the new dwellings built during the 10-year span to which the model refers; its accessibility corresponds to a suburban location.

[6]The numbers of model dwellings in Zones 1 through 4 are 7, 6, 9, and 9 with average levels of initial housing services (expressed in dollars per month at average initial-year housing prices) of 89, 94, 99, and 106 respectively.

The four cities are also identical in travel times associated with each zone and in the price of new construction. Our estimates of travel times were based on information for the SMSAs to which the model has been calibrated. In the hypothetical cities it takes approximately 25 percent more time to travel to work from the suburban zones than it does from the central city zones. Based on adjusted FHA data, the average price of new construction per unit of housing services during 1960-70 was put at $1.24, or 24 percent higher than the average price per unit of service of the housing stock in the initial year. This $1.24 new construction price has two components--operating costs and capital costs, which are set at 50 cents and 74 cents, respectively. Finally, the minimum quantity of services required in a newly constructed dwelling by building codes and zone restrictions was set to correspond to the smallest new dwelling actually built in the 1960s in metropolitan areas.[7]

Some analyses have been for the 1970-80 decade. For these simulations the base year (1970) quantity-of-housing service distribution was taken to be the values obtained through the 1960-70 simulations. Hence, the number of base year dwellings in each area equals the number of 1970 model households (Table 2.2). There are six zones in the 1970-80 simulations. The new housing built during the 1960s is located in a third suburban area (zone 5); and new construction takes place in zone 6. Travel times and the minimum requirements for new units are unchanged, but the household income and household-type distributions and factor prices are modified based on our projections. The contrasts between the cities in 1970 and 1980 are discussed in Chapter 5.

Aging our original prototypical areas over the 1970-80 period allows two types of analyses not possible from constructing the cities de novo as of 1970. First, the effects of a policy introduced in 1960 can be followed over a 20-

[7]This was a quantity of services of 65 units per month; See Chapter 4 of de Leeuw-Struyk, op.cit.

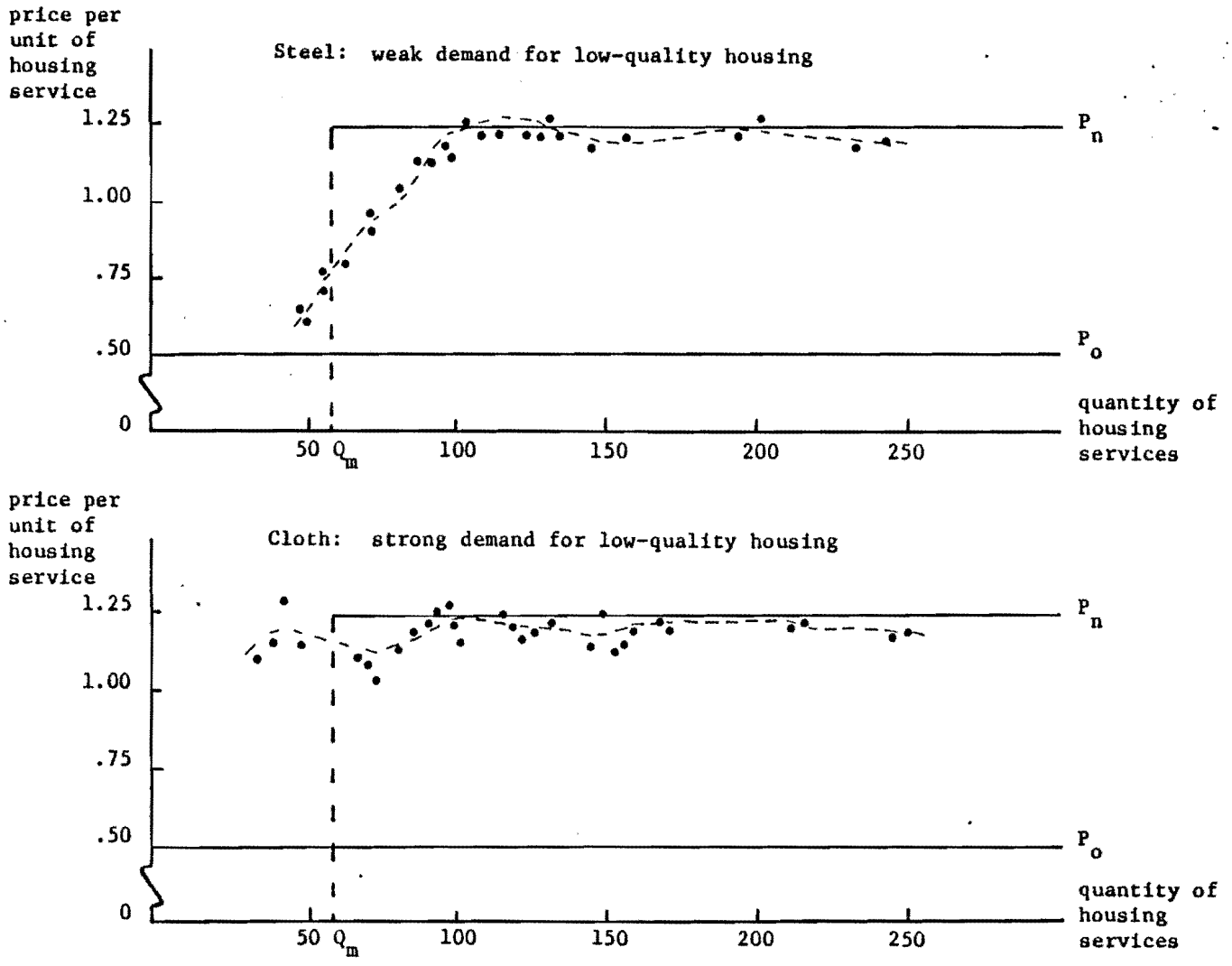
year period, instead of the single decade simulated in a single run of the model. Second, the progress or deterioration in the housing situation of groups of households with shifts in actual market conditions can be traced over the 20 year (1960-80) period.

There is, however, a cost to this procedure in that the four prototypical cities will become more similar over time. Because some areas which were fast growing in the 1960s may be slow growing in the 1970s, the 1980 results obtained using our procedure will not apply to the faster growing cities of the 1970s but rather to those of the 1960s. Hence, the clarity of our city-typology is reduced by aging each of the cities to 1980. Defining a new set of prototypical cities, though, has the disadvantage of making the 1960-70 and 1970-80 results not strictly comparable.

Confronted with the necessity of choosing a single approach, we elected to follow the original cohort of cities represented by each of the prototypical cities to 1980. The gain of being able to monitor the rate of progress of groups of households, as defined by income, race, and age, in a fixed set of cities was thought to outweigh the gains possible from documenting the differences among types of cities more accurately for a single-decade.

Base or No-Policy Outcomes for 1970. This section is designed to further acclimate the reader to our four prototypical cities and to demonstrate some of the properties of actual housing markets which the model solutions capture. We begin by introducing the price-structure curves in Figure 2.2. These curves refer to what we term "no-policy" outcomes--solutions in which no additional government actions beyond those actually in effect over the calibration period are introduced. The curves in the figure are actually for two of our eight cases (four cities and two sets of supply parameters). The upper curve in the figure is for Steel, the high-minority slow-growth area under the inelastic supply assumptions, while the lower curve is for Cloth, the high-

Figure 2.2
The Structure of Housing Prices



minority rapid-growth area under the elastic supply assumption.

The horizontal axis in the figure measures the quantity of housing services per month produced by each dwelling, and the vertical axis measures price per unit of housing service for each of these dwellings. The points on the two curves represent specific model dwellings showing the quantity of services produced per month and the price per unit of service which the occupant pays for these services.[8] Each point of the curve can be thought of as the intersection of a negatively-sloped demand curve and a positively sloped supply curve.

Generally prices per unit of service will lie between the price per unit of service of newly built dwellings (P_n) and the price per unit of service just sufficient to cover operating costs, i.e., to keep it in the available stock (P_o). P_n serves as an upper limit to housing prices for most dwellings because a household is very unlikely to pay more per unit of service for an existing dwelling than for a new dwelling of identical level of services. The important exception to this ceiling role of P_n is for low quantity-of-service dwellings with which new units cannot compete because of building codes; below the minimum permitted level of new housing services, represented by Q_m in the figure, there is no reason why prices per unit of service cannot exceed P_n.

Dynamic forces within most housing markets tend to keep prices close to the new construction ceiling for moderate- and high-service dwellings. These dynamic forces are (1) growth in real income over time, (2) growth in population over time, and (3) depreciation of dwellings over time. All three of these tend to create excess demand for housing at the high-service end of the range with the results that prices of existing dwellings in this range tend to be driven up toward the ceiling and new construction tends to take place in this range of services.

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[8]The total monthly cost to the occupant of each one of these points is the the quantity multiplied by the price per unit of service.

In the low-service end of the range the three forces do not act in the same direction. Growth in real incomes and depreciation of the housing stock probably tend to create an excess supply of dwellings in this range and hence lower price. Population growth, on the other hand, tends to increase the demand for services in this range, especially when population growth takes the form of an influx of low-income households. Where the excess-supply forces dominate, the result can be a situation found for Steel in the base year simulations. Where population growth is rapid and where there is an effective minimum Q_m near the low-service end of the scale the result can be a curve like found for Cloth.

Table 2.3 presents no-policy outcomes for all eight cases. Comparison of the various columns in the table substantiates the difference in average price associated with growth rates and with different elasticity assumptions. These differences in average price reflect differences at the low-quality end of the price structure curve, since the rest of the price structure curve corresponds fairly closely to the new construction price line in every case. Growth rates and elasticity assumptions also have a strong bearing on the number of initial-year dwellings withdrawn from the occupied stock, with high-growth and high elasticities both producing a relatively low withdrawal rate.

The prior discussion on the price structure curves suggested that high growth rates should lead to high average prices and few withdrawals from the occupied stock. The association of higher producer responsiveness with these same characteristics does not follow directly from the earlier discussion, but is not difficult to understand. "Adaptability" is one way to describe the housing stock under elastic, as contrasted to inelastic, supply conditions. Adaptable existing dwellings are capable of providing a wider range of housing services over the same range of price changes and

Table 2.3

No-Policy Simulation Results, Eight Cases, 1960-70

	High-Minority Areas				Low-Minority Areas			
	High-Growth Cloth		Low-Growth Steel		High-Growth Far West		Low-Growth Grain	
	Inelastic Supply	Elastic Supply	Inelastic Supply	Elastic Supply	Inelastic Supply	Elastic Supply	Inelastic Supply	Elastic Supply
1. Average quantities, prices, incomes:								
Quantity of services per household	124.4	125.4	124.3	126.8	129.1	129.3	129.4	131.4
Price per unit of service (dollars)	1.186	1.230	1.129	1.190	1.194	1.246	1.160	1.216
Income per household (dollars per month)	826.7	826.7	826.0	826.0	865.5	865.5	872.0	872.0
2. New dwellings and withdrawals								
New model dwellings	12	9	8	5	15	12	10	7
Withdrawals from existing housing stock	3	0	6	3	3	0	6	3
3. Location of minority households								
Number of black model households								
(a) Zone 1	6	5	4	4	1	2	2	1
(b) Zone 2-5	2	3	3	3	1	0	0	1
(c) Entire area (a + b)	8	8	7	7	2	2	2	2
Ratio, black to total households								
(a) Zone 1	1.00	.71	.80	.67	.17	.29	.40	.17
(b) Zones 2-5	.06	.09	.11	.11	.03	0	0	.03
(c) Entire area	.20	.20	.21	.21	.05	.05	.06	.06
(d) Segregation measure (a ÷ c)	5.0	3.6	3.8	3.2	3.4	5.8	6.7	2.8

Note: The differences in the elasticity of supply are differences in the responsiveness of those producers using the stock of housing present at the start of the simulation period to changes in the price offered to them by consumers. In the elastic case this responsiveness is 1.4 times that in the inelastic case.

can furnish households with the levels of services they want; thus they are more likely to command high prices and less likely to prove so unsatisfactory that withdrawal from the stock is necessary.[9]

With respect to racial segregation, the fact that the two low-minority cities have only two model households in the minority group makes it difficult to say very much about racial residential patterns. In the two high-minority cities, there is pervasive segregation under both assumptions about supplier behavior; black households are concentrated in Zone 1, the central city zone with a relatively low quality housing stock.

Summary

There are three facts from this chapter that the reader should apply when evaluating the policy analyses presented in the remainder of the book. The first concerns structure of the Urban Institute housing model. The model incorporates the fundamental durability and neighborhood-structure aspects of housing, and it explicitly allows for the existence of housing submarkets in response to supply-demand imbalances for dwellings providing different quantities of services or imbalances for dwellings with particular sets of neighborhood attributes, especially the racial and socioeconomic characteristics of others living in the neighborhood.

The second fact is that the behavior of households as consumers of housing services and landlords as suppliers of housing services as portrayed in the model is based on extensive empirical experience.

The final fact is that the prototypical cities employed in the policy analysis exhibit a sharp diversity in two factors which we have found to

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[9] Adaptability also lies behind the higher average quantity of housing services purchased, in spite of higher prices, under elastic than under inelastic supply assumptions.

have important effects on the final housing situation of households--racial composition and the rate of growth in the number of households. We have limited our diversity to these two factors to permit more precise explanations of the differences in policy outcomes among cities.

Chapter 3

Assessing the Long-Term Effects of the Section 8 Housing Program

The Housing and Community Development Act of 1974 created the Housing Assistance Payments Program, commonly referred to as the Section 8 Program.[1] The program was designed to supplement or supplant a number of other housing programs serving low income households. Although some characteristics of the former programs have been retained, significant changes have been made. The goals of decent, safe and sanitary housing remain. However, the procedure of providing direct funding to developers of low-income housing is not used by the program. Instead the Federal government assists low-income families in paying their monthly rents through a direct cash payment to landlords, hopefully inducing developers, builders, and financial institutions to provide decent housing.

Local jurisdictions now have more flexibility in meeting their housing needs. Importantly, the program permits variation in a mix of construction of new units, substantial rehabilitation of substandard units, and the use of standard existing units to meet the needs of the low-income population. The variations should depend in part on the condition of localities' housing stock. Once the mix of new, rehabilitated, and existing housing is determined, the local agency enters into lease agreements with suppliers and uses Federal funds to make the subsidy payments.

As noted in the opening chapter, the local flexibility embodied in the Section 8 program is truly innovative. For the first time it effectively

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[1] Title II, Section 8; 43 USC 1437f.

permits a community to design a housing program best suited to its own needs.

Each eligible locality applying for a community development grant must prepare a Housing Assistance Plan that (1) surveys the condition of existing housing, (2) establishes present and future housing needs and (3) indicates whether new construction is warranted by a shortage of standard existing housing. The purpose of these Housing Assistance Plans is to establish planning data and to relate the Section 8 program to actual local needs and housing market characteristics.

Housing units occupied by participants in the Section 8 program must meet locally specified quality standards and must rent for no more than a HUD established Fair Market Rent (FMR). FMRs are designed to reflect local housing costs, as well as the quality, location and physical amenities. Separate fair market rents for newly constructed units and for already existing units have been established for each market (usually a county or SMSA); the higher costs for new units reflect the higher standards which they must satisfy compared to existing units.

The implementation of a national housing policy such as Section 8 can cause a wide range of market effects, both direct and indirect in nature. Direct effects are those ensuing from the provisions of the policy itself; most notably, a certain number of new units may be built, the housing quality of participants improved, and the rent burden of participants changed. Indirect effects, such as changes in the quality of nonparticipants' housing, on the other hand, depend in part on market conditions at the start of the program.

There is a series of efforts underway to evaluate how well Section 8 is working in meeting its legislated objectives. Most of these analyses are focusing, appropriately, on the initial experiences of agencies, developers,

and participating households under the program.[2] The analysis presented in this chapter complements this work by focusing on the long-run, direct and indirect consequences which a sustained Section 8 program will produce. Further, while other evaluative efforts are analyzing actual program data, our work simulates the likely experience under the program. In sum, these long-term simulations are designed to help communities to determine which program mix would be best in their area as well as to provide one part of the evaluation of the overall usefulness of the program.

Section A of this chapter describes the program somewhat more fully and outlines how program-specifics have been translated into inputs for the simulation model. The mixes of units leased under the program between newly built and existing units which are analyzed are also stated. Section B presents the results of the simulations, and the final section provides a summary of the findings.

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[2] See, for example, "Major Changes Are Needed in the New Leased Housing Program," (Washington, D.C.: U.S. General Accounting Office, 1977).

A. Simulating Section 8

Defining the Program

Under the Section 8 program, the Federal government, by leasing newly built, substantially rehabilitated, and/or existing housing, provides direct housing assistance payments or subsidies on behalf of low-income families so that they may afford "decent housing". The subsidy makes up the difference between an approved rent and 15-25 percent of an eligible family's adjusted income. This capsule description of the Section 8 program indicates three key concepts which must be translated into model inputs--eligibility, decent housing, and approved rent.

Eligibility is restricted to renters and nonelderly single persons are categorically excluded. Among households passing these tests participation eligibility is based on the median income of the area in which households live. Families are eligible if their incomes fall below a certain percentage of the area's median income, and this percentage varies with family size. Income eligibility limits have been set separately for "low" and "very low-income" families. Since the model does not distinguish among families by size, a weighted average of the income limits for "low-income" families of all sizes is used to determine the average allowable maximum percent of the median. The weight used is number of families of each size as of 1970. The same percentage of the median income--73 percent--is used as the criterion for eligibility for all families in the simulations. The percentage of the total population and the number of model households eligible in each of the four cities, given this income cutoff, is shown in the second and third columns of Table 3.1. The number of households with incomes below 73 percent of the median is generally larger than the number that could be funded under the programs simulated, so not all income-eligible households are able to participate

Table 3.1

Income Eligible Households and Households Eligible to Participate Under Alternative Allocation Schemes

Prototypical City	TOTAL NUMBER OF MODEL HOUSEHOLDS	INCOME ELIGIBLE HOUSEHOLDS[a]		HOUSEHOLDS ELIGIBLE TO PARTICIPATE[b]					
				PROPORTIONAL ALLOCATION			FAIR SHARE ALLOCATION		
		Number of Model Households	Percent of all Model Households	Number of Model Households	Percent of Income Eligible Households	Percent of All Household-holds	Number of Model Households	Percent of Income Eligible Households	Percent of All Household-holds
Cloth: High Minority-Rapid Growth	40	11	28	4	36	10	8	73	20
Steel: High Minority-Slow Growth	33	12	36	4	33	12	6	50	18
Far West: Low Minority-Rapid Growth	43	13	30	5	38	12	c	c	c
Grain: Low Minority-Slow Growth	35	10	29	4	40	11	c	c	c

[a]Income eligible households are those earning less than 73 percent of the area's median income.

[b]All income eligible households are not eligible to participate in the Section 8 program because of funding limitations.

[c]No simulations were done under the fair share allocation scheme for low minority areas.

in the simulated programs.

The concept of decent housing is not tightly defined in the program regulations, in recognition of the fact that the same precise quality standards will not apply everywhere. For example, central heating systems are nonessential in southern Texas. In reality new units must meet minimum quality standards under the building codes imposed by most jurisdictions. In the model this standard is translated into a quantity of 65 units of housing service per month, based on Census data. The minimum quality standard for existing housing under the program is set at a quantity of services that equals 70 percent of the standard for new housing in the program. This corresponds to the level of services provided by dwellings with the physical characteristics generally required to meet program standards.

In order to be certified as eligible for occupancy by program participants, a dwelling must also rent for no more than the Fair Market Rent (FMR). National averages for the FMRs are used both for new units and for existing units.[3] It will be recalled that the prices of factor inputs for the prototypical cities were based on national figures; hence, the price per unit of service of newly constructed units under the program is the national average.[4] FMRs for existing units are potentially somewhat more variable, but an examination of existing unit FMRs in the groups of cities actually represented by each of the prototypical cities revealed little variance, so the national average was used.

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[3] The Fair Market Rents for new and existing units were published, respectively, in the Federal Register, March 1, 1976 and Federal Register, February 12, 1976 (Washington, D.C.: Government Printing Office).

[4] The national price per unit of service for new, unsubsidized units is used here, although it is possible for the price of services in new Section 8 dwellings built under the auspices of state housing finance agencies to be somewhat lower by virtue of the lower interest paid on their borrowings. However, since only 11 state agencies had engaged in such financing for any housing program by the time we began this work, the market price per unit of service for new units was used in this analysis.

The minimum quality standard represents the lower boundary for eligible units, and the FMR represents an upper boundary. A dwelling in the beginning-of-period stock must provide 45 units of housing service per month to meet the minimum program standard. At a normal 1970 price per unit of service, such a dwelling would rent for about $55 per month. The national average Fair Market Rent for a two-bedroom apartment in a dwelling in the stock in 1960, adjusted to 1970 prices, is about $90. Thus, these rules define a rather small range of units eligible for subsidies under Section 8, and this has definite effects on program outcomes.

An eligible household can receive the difference between the FMR and 15-25 percent of its income, depending on its degree of poverty. In the simulations all subsidies are determined using 25 percent of the income, since we are unable to make appropriate adjustments for family size. The program is financed within the model through a small income tax (under 1 percent) imposed on each household. Certain exemptions are deductible, and these deductions are such that no eligible household is taxed.

The Section 8 program has other provisions which are more difficult to precisely include in the simulation model. One is that the neighborhood in which leased units are located must meet certain standards. Another is the requirement for the program not to foster the increased spatial concentration of the poor. The fact that cities are divided into only a few zones in the model does not allow these requirements to be meaningfully included in the simulated programs.

A potentially more serious departure from the program is the way in which the mechanics of the subsidy payments are represented in the model. As noted, the actual program involves a contract between a local housing authority or other sponsor and a landlord. The household is able to choose a qualifying

unit in exchange for 25 percent of its income. The landlord collects rent from both the household and the Authority. There is also a shopping incentive, in the form of a cash payment, available to households who select dwellings whose rent is below the FMR ceilings. In the model this arrangement is represented somewhat differently. The household behaves as if it were given a cash grant equal to the difference between the rent of qualifying units and 25 percent of its income. This embodies the shopping incentive directly into household behavior by allowing it to keep the subsidy payment not spent on housing. The differences in the results from this formulation will be small, if the careful shopping provisions of the program work well.

A second source of possible differences stems from the range of units among which eligible households have to choose. The simulated program allows extensive choice among new and existing units meeting program criteria. In practice a smaller range of units may be under contract. Note, though, that having a lease does not guarantee the landlord will have eligible households sent to him; the local authority can enter into stand-by lease agreements many more existing units than it will be able to fill with participants, and it only pays for those which are occupied by participants. (For new dwellings built under program auspices, the Authority does have some financial responsibility.) So one expects there to be substantial range of units available under the actual program.

Another point regarding household behavior concerns the household's treatment of the subsidy. The Urban Institute model embodies the generally accepted view that housing consumption decisions are based on long-term or normal income. Because most of the poor are only temporarily poor, they will value an income-conditioned subsidy at less than its face value in making its housing choice. That is, it knows that the subsidy will decline as its income rises, or that more of its own income (even if a constant proportion) will go to housing as income increases. As a consequence the household will try to select a unit under

the subsidy which will still be suitable when and if the subsidy is reduced. For this reason, in addition to the shopping incentive, one expects not to see all households trying to occupy the most expensive units under the program, i.e., new units at the FMR ceiling. In reality, some households have little or no expectation of having incomes increase, and they might not behave in the way just described. But, recalling that each model household represents thousands of actual households, some average "discounting" of the Section 8 subsidy into normal income has been carried out for all of the model households.[5]

A truly accurate representation of the subsidy payment provisions of the Section 8 program would be most difficult to embody precisely in the model. The actual treatment, while seemingly rather divergent, closely approximates the program's intent. It does have one advantage as well: it allows exploration of program consequences (including participation) when eligible households are given substantially more latitude than they might have under specific implementation conditions.

Program Size and the Mix of New and Existing Units

The size of the program simulated is of great importance as it strongly influences the magnitude of indirect effects, such as inflation, caused by the program. The model uses three to four dozen "model" households and "model"

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[5] There is a good deal of evidence available supporting the point that most low-income households are only temporarily poor. Frank Levy, in his How Big is the American Underclass? (Washington, D.C.: Report to the U.S. Department of Labor, 1976), studied the changes in incomes of those in poverty in 1967 over the 1967-1973 period. He finds that about 25 percent escape poverty 5 out of the 6 years and another 30 percent are out of poverty half the time; the remaining group remains in poverty but incomes shift a good deal. Note that his sample excludes the aged and disabled. Other evidence, consistent with this is presented in T. Kelly, "Labor Supply and the Poverty Problem," (Washington, D.C.: Urban Institute Working Paper 958-3, 1972); and B. R. Schiller, "Equality, Opportunity, and the 'Good Job'," The Public Interest, Vol. 43, Spring 1976, pp. 111-120.

dwellings to represent an entire SMSA, so that each model household represents several thousand actual cases. If the total FY76 allocation of 400,000 Section 8 units were distributed evenly across metropolitan areas, it would affect at most one or two model households or dwellings in any one SMSA, thereby having very little effect on the entire market. To insure that the program simulated is large enough to have significant impact, the minimum number of model households and dwellings affected must be at least three or four or, in terms of dwellings, about 10 percent of the base year housing stock. To achieve this, we have simulated a full ten-year Section 8 program under which additional year-to-year allocations of 400,000 units are made to metropolitan areas, yielding a total of 4 million units nationally at the end of the decade.[6]

The assumed ten-year Section 8 program of 4 million units would affect roughly 10 percent of the total metropolitan housing stock (44 million units in 1970). The first scheme for allocating Section 8 units among cities assumes that in every SMSA the number of households eligible for Section 8 is equal to 10 percent of the base year stock of dwellings. This is referred to as the proportional allocation scheme.

The second allocation scheme is called the Fair Share Allocation. Under this scheme a disproportionate share (compared to the proportional allocation scheme) of Section 8 units is allocated to areas having a high proportion of minority households.[7] This allocation is consistent with the fair share criteria

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[6] This example ignores the legislative stipulation that at least 20 percent of Section 8 funds be allocated to rural areas; other Section 8 allocations go to urban areas outside of SMSAs. The annual increment would have to be substantially larger than the 400,000 units noted in the text to satisfy this requirement.

[7] The statement in the text is based on summing the funds distributed to each area office belonging to each of the four prototypical city types. That is, the funds going to area office cities with high fractions of minority households were found to be twice as large as the funds going to low-minority area office cities.

embodied in the legislation,[8] because several of these criteria, such as low income and high rent/income ratios, are highly correlated with race. The allocation of FY76 funds to area offices was used as a rough guide in determining fair share allocations. The guidance is rough because the allocations in this current year may not correspond closely to the actual ten-year allocations, and because allocations can be spread throughout different types of SMSAs covered by the area office. Our view is that the allocations under the fair share scheme represent an upper bound of the skewness associated with race. Using the same aggregate ten-year program of 4 million metropolitan units, 15 to 20 percent of the households in high minority areas are eligible to participate in the program under the Fair Share allocation, and proportionately fewer are eligible in low-minority areas. Because the small programs in these latter cities would have little market effect, the simulations under this allocation scheme are done only for the high-minority cities. Table 3.1 compares eligible households under the two allocation schemes for each of the prototypical cities which have been simulated.

In deciding which mixes of newly built, substantially rehabilitated, and existing units leased under Section 8 should be simulated, primary guidance might have come from the first year Housing Assistance Plans which had been submitted to the Department of Housing and Urban Development at the time this work was being designed. These plans, which specified a nearly equal mix among new, rehabilitated, and existing units, represented intentions rather than actual

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[8] Section 8 funds are to be distributed partially on the basis of a fair share percentage based on the following factors: total population, households with incomes less than 50 percent of the median, occupied units lacking plumbing facilities, occupied units with more than 1.01 persons per room, relative housing costs, and households with rent/income ratios greater than .25.

execution.[9] Figures on the type of units which were actually being included under the program on a national basis showed nearly an even split between newly built and existing units, with very few reservations for rehabilitated units.[10] These figures combined with the small number of units rehabilitated in the past under government programs led to the decision to simulate only mixes of new and existing units in this first set of analyses of the Section 8 program.

The base set of simulations is for a Section 8 program with funds distributed under the proportional allocation scheme and a 50 percent existing and 50 percent new unit mix, for all four of the prototypical cities. The analysis for each city was done under the two assumptions about supplier responsiveness to change in housing demand; so eight variants were simulated in all (4 cities X 2 assumptions). This set is complemented by simulations of the 50/50 program under the Fair Share allocation for the two high-minority prototypical cities (Cloth and Steel). It is this full set of simulations which is discussed first in the next section.

The decision as to which other mixes of new and existing units to simulate was guided by two broad considerations. First, the model is not structured so as to permit useful analysis of small changes in this mix. Since under the proportional allocation there are usually only four model households eligible (Table 3.1), to effect a major change from a 50/50 allocation requires using new or existing units exclusively. The second consideration was past

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[9] These figures are the simple means of the fractions in each type of unit (i.e., new, rehabilitated, or existing) for a sample of 147 cities drawn by HUD. They are reported in Community Development Block Grant Program: Second Annual Report (Washington, D.C.: U.S. Department of Housing and Urban Development, draft).

[10] Based on figures given in the July 26, 1976 Housing and Development Reporter, only 5 percent of total Section 8 funds were reserved for rehabilitation. Revised legislation now requires allocations to conform with the HAPs. Still, it seems likely that, based on prior experience, substantial rehabilitation will not play a major role.

experience in simulating new construction subsidy programs and housing allowances in alternative markets. This experience suggested that some program variations should be avoided in certain markets. For example, exclusive reliance on newly built units in a slow growing city would certainly produce substantial abandonment and not greater improvement in the housing of participants than other mixes. These factors plus the results from the base simulations led to the program results reported in the latter parts of the next section and include 100 percent new and existing programs under certain market conditions under both program fund allocation schemes.

All of the simulations reported in this chapter are for the 1960-70 period. The results of simulating a particular program variant, then, gives a view of how the 1970 urban housing situation would have differed if Section 8 had been operable over the decade of the 1960s. In Chapter 5 projections are made of urban housing conditions in 1980, and part of the work reported there is the changes which the presence of a major Section 8 program might produce. More emphasis is placed on the 1960-70 results of simulating Section 8, however, because of the greater uncertainty which projections necessarily entail. These uncertainties are detailed in Chapter 5.

B. Simulation Results

Basic Policy Simulations

Three dimensions of the simulations--market types, program size and program restrictions--are key determinants of the direct and indirect effects of a large-scale housing program such as Section 8. The results of the base set of policy simulations, presented in Table 3.2, are designed to focus on these three aspects. The first six cases represent variations in only initial market type; program size, minimum standards, and Fair Market Rent ceilings are held constant. Variations in market conditions are presented by the four prototypical cities which vary in racial compositions and the growth rates of low- and moderate-income households. Cases 7 and 8 represent variations in program size, with market conditions and program restrictions controlled. The variation in program size is achieved through the two allocation schemes; roughly twice as many households are eligible in the high minority cities under the Fair Share allocation scheme as under the proportional allocation system.

All of the base policy simulations are for the same type of program--half new construction and half existing housing. Each set of results presented in the table is stated in terms of change or difference comparing a "no-policy" simulation with one including the policy under examination. Thus the policy question addressed by this analysis: How would the housing situation in a given market differ in 1970 from the actual situation if the program had been in effect?[11]

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[11] The results of the no policy simulations are given in Chapter 2.

Table 3.2 does not contain results from all the policy simulations detailed in the last section as being in the base set of simulations. Selective cases have been chosen as representative of the full set of simulations. Appendix Table D-1 describes all of the simulations done in the paper. Results for the base policy simulations can be found in Appendix Table D-2; these include all twelve cases and show changes in the housing situation of participants and other households as well.

The direct market effects of implementing a Section 8 program are examined by looking at the participation rate of eligible households, the average subsidy, and the extent to which the subsidy is converted into increased housing expenditure (earmarking ratio). Direct effects are also measured by changes in the quantity of housing services consumed, in housing expenditure, and in the average housing prices facing participants. The indirect market effects can be gauged by looking at the impact of the program on nonparticipating households and on the stock of private or unsubsidized units. Changes in the housing stock caused by the program are measured by the change in the number of units withdrawn from the housing stock balanced against the change in the number of newly constructed units.

Participation Rates and Variations in Outcomes Associated with Different Rates Glancing across the top row of Table 3.2 one observes participation rates varying from 50 to 100 percent. Less-than-full participation results in part from the structure of the program and in part from the way recipients value income transfers. The program focuses the demand of participants on a fairly narrow range of housing: dwellings must meet minimum standards but must not rent for more than the FMR. In a typical case, there might be four eligible model households but only three model dwellings in the existing stock which

Table 3.2

Results of the Basic Policy Simulations of a Section 8 Program: 50 Percent Newly Constructed Units and 50 Percent Existing Units

ALLOCATION SCHEME	PROPORTIONAL ALLOCATION						FAIR SHARE ALLOCATION	
	CLOTH		STEEL		FAR WEST	GRAIN	STEEL	
MARKET TYPE	HIGH MINORITY RAPID GROWTH		HIGH MINORITY SLOW GROWTH		LOW MIN RAPID GROWTH	LOW MIN SLOW GROWTH	HIGH MINORITY SLOW GROWTH	
ELASTICITY ASSUMPTION	Elastic	Elastic	Elastic	Inelastic	Elastic	Elastic	Elastic	Inelastic
PROGRAM TYPE	C[d]	A[b]	A	A	A	A	A	A
CASE NUMBER	1	2	3	4	5	6	7	8
1. Participation Rate	.50	1.00	1.00	.50	1.00	1.00	1.00	.83
2. Average Subsidy	$29	$24	$34	$33	$27	$28	$38	$34
3. Earmarking Ratio[c]								
New	---	1.68	1.25	1.39	1.16	1.84	1.06	1.27
Existing	.45	.47	.36	--	.44	.46	.65	.82
4. Average percentage change in Quantity of housing services								
Participants								
New	--	27	38	34	28	29	33	31
Existing	13	20	20	---	30	25	42	25
5. Average percentage change in expenditure								
Participants								
New	--	27	48	57	21	42	41	67
Existing	17	19	19	---	22	25	51	64
All households	0	2	3	1	4	4	9	9
6. Percent of increase in expenditure attributed to price inflation[d]								
Participants	25	1	9	29	0[e]	15	17	45
7. Average price per unit of service								
Participants								
1. Base	1.193[f]	1.215[f]	1.143	1.064	1.231	1.139	1.092	.878
2. Policy - New	NP	1.24	1.24	1.24	1.24	1.24	1.24	1.24
- Existing	1.245	1.187	1.115	NP	1.147	1.157	1.126	.970
8. Number Units Withdrawn								
Base	0	0	3	6	0	3	3	6
Policy	0	2	5	7	3	5	6	8
9. Change in the Number of New Units	0	2	2	1	3	2	3	2

[a] All eligible households free to choose between new and existing units, or nonparticipation.

[b] Some eligible households exogenously assigned to new units.

[c] Earmarking ratio is the change in housing expenditure to subsidy received.

[d] Percent change in price divided by percent change in expenditure.

[e] Overall price to participants declined.

[f] Difference in base price caused by different households participating.

findings. Certainly, when new units are built, more households have improved housing. In some market conditions program participation would be limited by an insufficient number of suitable existing units, so that in time households might want new units after all. On the other hand, the program costs are greater, and the cost of providing the housing to some of the participants will be greater than the value they attach to it.

Overall, it seems likely that even in a full-choice world some new units would be sought by participants. Too heavy a reliance on new construction would likely lead to rent-up problems, if the program were as large as that simulated here. Short of this point and assuming some action by local communities to insure the rent-up of new units, the assumption used in the remainder of the chapter of full occupancy of new units seems justified.

Variations in Market Conditions. Cases 2, 3, 5 and 6 in the table represent a constant program (half new-half existing) under elastic or responsive assumptions about supplier behavior for the four prototypical cities. Thus the full range of market types is covered for a single program. (Variations in effects among markets for different programs is explored in a later section.) All four markets have 100 percent participation, primarily because half of the households are assigned to units built under Section 8 auspices.

The first thing to note is the effect on participants' housing consumption. Consistently the increase averages 25-30 under the program. The small variance is striking. Also, as noted for cases 1 and 2, the earmarking ratios are consistently higher for new units; but even for existing units about half of the subsidy is being converted into housing expenditures. On this basis the program appears to be very efficient. Another similarity is the generally small proportion of increased expenditures which are due to price increases (item 6 in the table).

can meet the program criteria. While newly constructed units are available under the program, we shall see below that when given a maximum degree of choice households prefer existing units. There is sharp competition for the program eligible dwellings; but it is a limited competition because a ceiling to the bidding is enforced through the FMR. Under these conditions, it is quite possible to have situations where market solutions are not possible; and such situations have been encountered in the simulations.[12]

A closely related, and policy-important, question is why newly built Section 8 units are consistently overlooked by eligible households under conditions of maximum choice. To explain this it will help to first set the state more carefully by considering two of the simulated cases in some detail. Cases 1 and 2 in Table 3.2 are for the same policy--a 50/50 split between new units and existing units simulated under elastic supply assumptions in a high minority-rapid growth area. They differ only in that all eligible households in Case 1 are free to choose between newly constructed units and already existing units, but in the second case they are not. The cases in which households are allowed free choice are labelled Program Type C in the table; others are labelled Type A.[13] The 50 percent participation rate in Case 1 occurs because the moderate income eligible households find that 25 percent of their current income is sufficient, without a subsidy, to cover the rent of the existing units they choose. The rents on these existing units exceeds the FMR on existing units, but are below the FMR ceiling on new units. These households could have selected

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[12] An acceptable solution requires that each dwelling be occupied by only one occupant. Appendix E provides a diagrammatic exploration of how two or more eligible households end up in unresolved competition for one of the small number of dwellings meeting all Section 8 requirements.

[13] Other free choice models are presented in Appendix D. They are cases C1, C3, C7, C9, D5-D8, and D13-D17.

larger newly constructed units, while presumably holding their housing expenditures to 25 percent of income; but they did not.

The reason why many families with free choice prefer existing housing stems from the conversion of any income subsidy (whether actually given to the household or paid to the landlord directly) into permanent income before evaluating the housing opportunities under the program. Given that housing choices are based on permanent or normal income and that households eligible for Section 8 fall in the lower end of the income distribution, any addition to current income (such as a housing subsidy) is discounted by most households in converting it into permanent income. In the case at hand, the moderate income household's permanent income would rise by less than the amount of the transfer so it would have to devote other, nontransfer income to housing in order to occupy a unit newly built under the program.[14] Recall that the household even with the subsidy is trying to occupy a unit consistent with its long-term income expectations in order to avoid spending too much of its own funds on housing or having to relocate when its income rises.

Simulations like Case 1 involve giving households a wide range of choice and having households making their housing decisions under the Section 8 program

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[14] Since this is the key to understanding the reason for new units being less preferred than might be expected, it is worth illustrating how the real cost of a new unit to an eligible household can be greater than the real cost of an existing unit. Consider a household whose current income is $100 per month, and who occupies his optimal dwelling before the transfer which rents for $25 which constitutes 15 percent of his permanent income. The subsidy which it could receive for the minimum size new unit and the minimum size existing unit which satisfy program conditions are $50 and $25, respectively. The apparent costs to the household, i.e., 25 percent of its current income, are equal. If the subsidies are then discounted by 25 percent, the value of the subsidies for housing decisions are $40 for the new unit and $20 for the existing unit. To participate, the household would have to spend $10 more than the desired long-run expenditure for a new unit but only $5 for the existing one. In practice, the FMR for existing units is set above the minimum quantity so that very often the household will contribute none of its own funds to occupy units in the existing stock under the program.

in a careful long-term satisfaction maximizing way. As such they can be thought of representing an extreme situation in some senses. Case 2 depicts a situation in which new units are selected for reasons not included in a strict utility maximizing decision calculus of the type used in the Urban Institute model.[15] In this type of simulation, the eligible households who elected not to participate are given subsidies and exogenously assigned to new units constructed under the Section 8 program. In practice, this amounts to households being "steered" by the local housing authority to new units or of the household not responding to economic incentives, like the shopping incentive as strongly as expected.[16] In the remaining simulations eligible households have been assigned to new units whenever new units are included in the program. (These cases are designated program type A in the table.) The results of simulations like Case 1 nevertheless suggest that many eligible households may be less anxious to occupy new dwellings compared to existing ones, although this preference might not be strong enough to keep them from participating in the program.

A comparison of Cases 1 and 2, the free choice model and the assignment model (with market conditions and program size held constant), indicates that assigning households to new units yields rather different results. The 50 percent participation rate in Case 1 reflects the nonparticipation of moderate-income households assigned in Case 2 to new units--participation is 100 percent in Case 2. The moderate-income households in new Section 8 units

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[15] These cases do not correspond to those in which there is no discounting of transfer income. Results of such simulations would differ fairly sharply from those reported here in the incremental demand by participants produced by the program.

[16] "Steering" does not necessarily have a pejorative connotation. The Section 8 regulations place the burden for shopping, arranging the lease, and doing an initial inspection of the unit squarely on the participant. Assistance from the Authority may not only be welcomed, it may be essential to program participation.

have sufficiently higher incomes to require smaller subsidies than those households in existing housing despite the higher FMR for new units. Hence the average subsidy payment is smaller in Case 2 than in Case 1, although the aggregate program costs are greater.

The earmarking ratio--the change in housing expenditures compared to the subsidy received--is higher for new units than for existing ones because new units have the higher minimum quality standards. This higher earmarking ratio, indicative of greater program efficiency, is consistent with the households' preference for existing housing.

The change in the quantity of housing consumed by households choosing existing units under the program is higher in the assignment model because the movement of some households into new Section 8 units loosens the market for existing units in the critical quality range. The changes in expenditures are almost equal for existing housing in Cases 1 and 2, but expenditures increase more for new housing. There is almost no price inflation in the assignment model versus 25 percent in the free choice version, again because of the increase in supply represented by the new units.

Assigning households to new units is, in effect, subsidizing new units that would not have been built under a program like a housing allowance. Hence, lower quality new units built under Seciton 8 auspices are not simple substitutes for larger new units; that is, they do not displace other construction but represent net additions to new construction. This is evidenced by the fact that in every case in Table 3.2, the number of additional new units equals the number of households assigned to new units. The increase in the number of new units also equals the number of units withdrawn.

It is difficult to give a summary judgment on participation rates or on the desirability of the construction of new Section 8 units based on these

Why are these effects so similar over such diverse market conditions? The key to understanding what is happening is to look at the changes in the price of housing services faced by participants. Price changes have consistently been the volatile market factor when simulating the effects of introducing major programs. In these simulations, participants in markets associated with discounted prices for lower quality housing--slower growth of low-income households and low price elasticities of supply--are more prone to experience price increases. The reason for this is that in such situations suppliers improve their dwellings in response to price increases, and it is often this improvement which enables their dwellings to meet program standards. This process is stopped, though, when the supply of units in this quality range is increased through filtering--like that produced by the construction of new Section 8 units. When the price of low-quality housing is already high, this type of improvement (and price increase) is generally not possible; but filtering can still cause price reductions. The low minority-low growth city, Case 6, exhibits the greatest discounting among the four cases and is the only city to record a price rise for eligible households in existing units under the program. Otherwise, the new construction feature of the program offsets the price effects of increased demand, and encourages increased consumption. With the same proportion of households participating (i.e., demand stimulus), the muting of price effects guarantees fairly similar outcomes.

Another comparison of market conditions is that of elastic supply versus inelastic supply--Cases 3 and 4, for example. One important difference is evident, which stems from the differences in initial prices faced by eligible households. The inelastic case (No. 4) has the lower average initial price level for lower quality units; and this influences the participation rate: None

of the eligible households choose to occupy Section 8 existing units because lower quality housing sells so cheaply it would require a very large increase in expenditure to meet program standards.[17] There is a clear pattern of lower participation for other inelastic cases when a 50 percent new-50 percent existing program is employed.[18] This may provide another explanation for low participation rates if encountered in actual program implementation.

What happens to the price of housing and housing consumption of nonparticipants (both eligible and ineligible) who normally compete with Section 8 program participants for the same housing when the program is implemented? Although data to address this question is not included separately in the tables, the simulation results are quite clear: Nonparticipants are little affected by the program. For programs run under the proportional allocation system nonparticipants' quantity of housing services increase or remain constant and price increases are below 5 percent under all market conditions-elasticity assumptions. For the Fair Share allocation scheme, the changes are somewhat larger on average in the high minority areas where almost twice as many households participate under the Fair Share than under the proportional allocation; but the increase in price and decrease in consumption never exceed 7 percent. The small size of the market effects on nonparticipants is largely attributable to the structure of the program. It is sharply targeted by the quality standards and FMR ceilings. The latter factor places a direct lid on the extent of price increase for eligible units. Additional, indirect

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[17]Tentative evidence suggests that some tenants may face substantial rent increases in order to participate in Section 8. An example from Newark suggests that a family now paying $180 a month in a rundown building without a subsidy could pay as much as $280 as its share of the rent under Section 8 regulation. See Housing Development Reporter, Vol. 4, No. 10, October 18, 1976.

[18]Contrast the following pairs of cases in Appendix D: C11-C12, C13-C14, and C15-C16.

relief of price pressures is often provided by newly built Section 8 units augmenting the supply of program eligible dwellings.

Overall, we conclude that market conditions influence policy outcomes. The influence under a Section 8 program leasing equivalent numbers of new and existing housing is less decisive, however, than the effects of a housing allowance, for example. The reason for the smaller effects is the fact that by operating to augment supply (new units) while raising demand (transfer payments) most market pressures are alleviated.

Program Size An idea of differences in market effects caused by increasing the program size can be seen by examining several cases for the Steel, the high minority-slow growth city--in particular Cases 3 vs. 7, and 4 vs. 8. Cases 3 and 4 involve the proportional allocation scheme with four model households eligible, while cases 7 and 8 involve the Fair Share allocation scheme and have 50 percent more model households eligible.

Increasing the size of the program while controlling for market conditions and program variation does not in general cause sharply different effects. Using a housing allowance program for comparison, doubling the size of the allowance program had much more drastic effects on prices faced by participants, than we observe in simulating Section 8.[19] In the present simulations, increasing the size of the program caused the percentage change in the price per unit of service for participants to generally increase modestly and prices never more than 30 percent beyond what they would have been in the absence of the program. In some instances, like Case 8, a substantial proportion of the

[19] de Leeuw and Struyk, op.cit., Chapter 6.

subsidy for existing units goes to price increase, but consumption still rises by 25 percent. The larger changes in prices are again associated with the initial discounting of the price of lower quality housing, which cases 4 and 8 illustrate. (Both assume inelastic supply responsiveness and have relatively low base prices for participants.) The larger program makes more of the lowest income households eligible for existing housing under the program. Most of these participate leading to large increases in housing consumption--in several cases consumption for participants in existing units rises by over 40 percent (item 4 in the table).[20]

Increasing household eligibility may not, however, always result in an equal increase in participants. Less than full participation in the cases simulated under the assumption of inelastic supplier responsiveness is attributable to the low prices eligibles are paying for housing when the program is implemented. An eligible household may not want to increase expenditures on housing to 25 percent of its income in order to participate in the Section 8 program.

On balance, these results show that a program allocating a larger number of Section 8 dwellings than under the proportional allocation plan would appear to be feasible in terms of the side effects it produces in the market. Under the 50 percent new-50 percent existing allocation, at least, the larger allocations would improve the effectiveness of the program by increasing participation and housing consumption.

Variations in Mix of Newly Built and Existing Units

The program used thus far--a 50-50 split between new and existing dwellings with the fair market rent ceiling on the subsidy payment--may also be varied, causing a different set of market effects. The simulations shown in Table 3.3

[20] Also see Cases C13 and C14 in Appendix Table D-2.

Table 3.3

Policy Variations - Selected Results for Section 8 Programs*
Fair Share Allocation

	CLOTH: HIGH MINORITY-RAPID GROWTH				
	50/50 (50% new, 50% existing)	100% Existing[a]	100% New	No FMR Ceiling	No FMR or Maximum Subsidy
Program Type	A	C	A	C	C
Case Number	9	10	11	12	13
1. Participation Rate	1.00	.50	1.00	.75	.875
2. Average Subsidy	$43	$29	$30	$41	$46
3. Earmarking Ratio					
New	1.05	--	.789	--	--
Existing	.64	.45	--	.660	.725
4. Average percentage change in Quantity of housing services Participants					
New	20	--	29	--	--
Existing	71	13	--	32	44
5. Average percentage change in expenditures					
a. Participants					
New	22	--	31	--	--
Existing	68	17	--	43	49
b. All households	8	0	3	3	2
6. Percent of increase in expenditure attributed to price inflation					
Participants	4	25	5	21	7
7. Average Price Per Unit of Service[b]					
Participants					
Base	1.218	1.193	1.220	1.214	1.215
Policy - New	1.24	--	1.24	--	--
- Existing	1.195	1.245	--	1.325	1.256
8. Number of Units Withdrawn					
Base[b]	0	0	0	0	0
Policy	4	0	8	3	4
9. Change in the Number of New Units	4	0	8	3	4

Note: *All simulations in this table are under elastic supply assumptions

[a] Proportional Allocation

[b] Differences in base prices for participants arise from differences in participation rates.

differ in the mix of new and existing housing. With a single exception, all cases shown in the table are for the high minority-rapid growth city under the Fair Share Allocation. The exception is the 100 percent existing program (Case 10) which was not simulated for the high growth areas because of the tightness of the markets; in this instance the smaller, proportional allocation of Section 8 units to the high minority areas is used. The cases presented in Table 8 are representative of several other runs not reported in the text; a full table of results from simulating various policy variations appear in Appendix Table D-3.

The base case for the review of these results, given in the first column of Table 3.2, is one with equal shares of new and existing housing leased under the program. This particular mix produced an extremely large increase in the quantity of housing consumed by the four model households who select existing dwellings. This increase is greater than observed in high minority-slow growth city reviewed in the last section (Cases 7 and 8, Table 3.2), because of greater initial tightness in the high growth market and the consequent greater relief provided by the construction of new units for low income households.[21]

Under the 100 percent new program, in which all eight eligible model households are assigned to dwellings built under the program, the overall increase in consumption for participants is 29 percent compared to 45 percent in the base case just reviewed.[22] The average price per unit of service for participants is the new construction price. In the rapidly growing city, the

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[21] Two very low income households who select existing units double the quantity of services they consume while the other two selecting existing housing increase their consumption by about 40 percent.

[22] The reader should note that this result is not dependent on the particular assignments made of new units to participating households. The size of unit assigned was that corresponding to the household's optimal new unit, given the subsidy, subject to two constraints. If the optimal unit was smaller than allowed by building codes, the minimum standard new unit was assigned. If the optimal new unit would have exceeded the FMR ceiling, one at the ceiling was assigned.

going prices faced by participants are high so that the price increases induced by the program are small. It is this slight price increase which accounts for the lower earmarking ratio compared to other cases in which newly built Section 8 units are occupied. Compared to a 100 percent existing program (Case 10), the program variation using new units exclusively produces greater participation and a somewhat greater increase in housing quantity. But it also causes the withdrawal of 25 percent of the units in the beginning-of-period stock, which is equivalent to the number of new units built under the program. This would clearly produce substantial dislocations and must be viewed as a strong deterrent to exclusive reliance on newly built units.

Although not included in the text tables, the contrast between a half new-half existing program and a 100 percent new program (with all eligibles participating in both cases) for Cloth and Far West, the two rapidly growing cities, under the proportional allocation scheme should be noted. Consistent with the results just reviewed for Cloth under the Fair Share Allocation, the half-and-half program generally leads to a somewhat greater increase in consumption on the part of participants, a gain due to the effectiveness of limited filtering of the existing stock.[23]

A final policy variation of importance, not shown in the text table, is a program utilizing only the existing stock of housing in a slow growth market where there is more likely to be an adequate or excess supply of standard existing units. The results of such a program have already basically been reviewed, since they are the same as those under the free choice model when no households elect newly built units. The participation rate is low, only 50 percent in this case, and participants' housing consumption increases by about a third. Significantly, there are no additional units removed from the stock under the

[23] For details see Cases D1-D4 and C2, C4, C11 and C12 in Appendix D.

program using existing units. The main conclusion here, though, is that it is really not feasible to shift to a 100 percent existing program in the slow growing areas, given current structure of the program, because participation is limited by availability of dwellings meeting program criteria.

Removing the Fair Market Rent Restriction

There has been some contention since the initial formulation of the Section 8 program that not allowing households participating in the program to spend more than the Fair Market Rent for housing while holding the government subsidy constant would reduce program effectiveness. The main argument has been that housing consumption would be held below the level desired by some participants and hence some potential housing improvement is not being achieved.[24] Earlier in this chapter, we have seen cases in which participation rates might be reduced because of this feature. In this final part of our analysis of the Section 8 program we explore a major change in the program from its current structure by analyzing the effects of removing the FMR ceiling on rents.

The Fair Market Rent ceiling is removed in Case 12 in Table 3.3, but the maximum government contribution based on the FMR is maintained. This means that, unlike the actual program, the households will be allowed to participate in the program if they occupy a unit whose rent is greater than the FMR. Note that in this simulation, households are allowed full choice between new and existing housing under the program as well as nonparticipation, and for this reason, the results are not strictly comparable to other simulations under the Fair Share Allocation. The participation rate is slightly higher under

[24] J. E. Goedert and J. E. Goodman, Jr., "Reviewing the Rent Ceiling in the Section 8 (Existing Housing) Program: Evidence from the Experimental Housing Allowance Program," (Washington, D.C.: Urban Institute Working Paper 240-1, 1976.

this variant than in the free choice model under the proportional allocation. A larger proportion of the eligible households choose existing units over not participating. None of the eligibles select new units. The participation effect of removing the ceiling is modest because the two eligible model households who exceed the FMR on existing units are spending more than 25 percent of their income on housing, and hence fail to qualify for this subsidy, and they also elect not to occupy a new Section 8 unit. The increase in participation, then, is completely among the lowest-income households. Examination of the housing expenditures of these households shows that participation would have been lower if the ceiling were in effect. Average subsidies, as expected, rise in the absence of the FMR ceiling since the four lower income households are the marginal participants. The consumption of participants is also greater than under the proportional allocation simulations where full choice is permitted and is of the same order of magnitude as under the 50/50 Fair Share Allocation.

The program is further modified in Case 13, in which the government's contribution is unlimited: Households now simply receive the difference between their rent and 25 percent of their incomes. Participation is increased by one of the moderate-income eligible households now being able to occupy a fairly large existing unit. This causes the average percent change in housing consumption to rise. Participants still do not choose new units, but price pressure is relieved a good deal because an additional new unit is added, making available an existing unit suitable for the program.

Overall, the results from these and other cases simulated under the Fair Share Allocation without FMR ceiling suggest that the impact of removing the ceiling will have at least moderate effects on participation. On the other hand, removal of the ceiling under the Proportional Allocation did not increase

participation; the reason for the difference with program size is that under the Fair Share Allocation price pressure on ineligible moderate-income households is sufficient to induce some of them to select new units which makes more existing units available to participants.

C. Overview of Findings

Perhaps the most important result is how the simulated program effected the housing condition of participating households. In general the participants increased their housing consumption significantly. While the amount varied with market conditions and with the type of program and assumptions about supplier behavior, participants increased their housing consumption by about 27 percent on average under the basic Section 8 program simulated. The increase in the quantity of housing services consumed is moderately sensitive to the mix in the allocation of Section 8 between new and existing units, as reviewed below. Larger Section 8 programs, which increase the number of the lowest income households participating, raised the average consumption increase about 25-30 percent beyond the basic program simulated. Also, under some program size-market combinations allowing rents paid by participants to exceed the Fair Market Rent while holding the maximum subsidy constant, increased participation of lowest income households and the average increase in housing services consumed by participants.

Participation rates for income-eligible households were high, varying from 50 to 100 percent in the simulations. Participation rates were around 50 percent in cases in which eligible households were allowed to choose between new and existing units based on a strict utility maximizing framework and assuming a strong incentive to make long-term housing decisions. New units under the program provide a greater quantity of services than most existing units, but they often would require families to increase their housing expenditures by more than they would like over the long term as household income rises and subsidy payments are reduced. So existing units were preferred. However, competition for the limited number of existing units meeting the program criteria

was intense, and rising prices caused some eligibles to decline participation. Full participation is likely when eligibles are given greater incentives by the local housing authority to consider new units, and for most of the analysis done here the presence of such incentives was assumed.

In certain cases participation rates were adversely affected by the initial price per unit of housing services paid by eligibles. In particular, in those markets where the price of housing services faced by the lowest income eligibles before the program was very low relative to the price of units meeting the program's quality standards, these households often elected not to participate. The necessity of increasing housing expenditures to 25 percent of income discouraged them even after considering the benefits of the subsidy. Participation was reduced to 75-80 percent under a half existing-half new units program, even when occupancy of the newly built Section 8 units was assured.

One criterion for program efficiency is the fraction of the subsidy which is transformed into increased housing expenditures. In these terms, the Section 8 program was reasonably efficient with 60 percent of all subsidy payments reflected in higher housing expenditures. These ratios were consistently higher for new units leased under the program--often in excess of 1.0--than for existing units. Further, the proportion of the expenditure increase that was due to higher prices for housing services rather than increased housing consumption was modest under nearly all of the program-market combinations simulated. Note that the portion of the subsidy payments not spent on additional housing reduced rent burdens.

The indirect effects of implementing the program considered were the consequences for nonparticipating low-income households and for the stock of privately owned housing. The structure of the program largely insulates nonparticipants from deleterious effects. On the one hand, the program is sharply

targeted: dwellings must meet minimum quality standards and rents cannot exceed a maximum. The second condition places a lid on the amount of price increase possible. This limited the number of dwellings that could be profitably modified to serve eligible households, and it simultaneously restricted the advantage (possible if rents could exceed FMRs) of participants in bidding for units. Also, typically, the existing dwellings placed under contracts were few compared to the number of participating households. All of these forces together worked to make the overall market effects small. Although price changes and the reallocation of dwellings among households predominantly affected participants, the use of a mix of newly built dwellings and dwellings in the existing stock for most of the program variants alleviated those effects that did spill over to nonparticipants.

The effect on the housing stock varied with the type of program simulated. At one extreme, a program leasing only existing units caused no increase in the number of units withdrawn from the active stock over the decade. On the othe hand, program versions which made use of newly built housing produced a number of additional withdrawals equal to the number of new units built under the program. In part, this reflects the finding that the new units built under Section 8 are not substitutes for other new housing. The cost of these withdrawals must be evaluated on a case-by-case basis, and any judgment would depend largely on the quality of the units dropped from the stock and types of neighborhoods in which they were located.

Overall, being able to use both the demand side stimulants (transfers to households) and supply augmenting actions (leasing newly constructed units) is clearly a very important and valuable aspect of the program. It is also clearly valuable to shift the mix of leased new and existing dwellings under alternative market conditions. The desirability of leasing some existing

units in areas experiencing relatively low growth in the number of low-income households and leasing at least some newly built units in markets experiencing high growth rates in the number of these households is evident. In the rapidly growing areas, a program relying exclusively on newly built units produced roughly a 22 percent increase in the housing consumption of participants, while a program splitting the allocation evenly between new and existing units produced an average 32 percent increase for the six cases simulated. The difference reflects the efficiency of loosening a tight market through new building while also employing existing housing. Also, greater emphasis on newly constructed dwellings caused a greater number of dwellings in the base year stock to be withdrawn. On the other hand, attempting to lease existing units exclusively in the low growth areas was constrained by a lack of dwellings meeting program quality and maximum rent criteria.

We might also note here that the results of the limited number of simulations done for the 1970 to 1980 period generally agreed with the main corpus of simulation results for 1960 to 1970. One difference which did emerge was that participation rates were somewhat higher. These higher rates were caused by the lowest income eligible households spending well over 25 percent of their incomes on housing in the absence of the program, due to rapid housing price increases over the decade. Thus, they were eligible for the program, while under certain market conditions in the 1960s, the same households would have spent less than the program-necessary quarter of their income on housing.[25]

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[25]For details see Chapter 5.

Chapter 4

Effects of Welfare Reform and General Construction Subsidies on the Housing of the Poor

Many federal programs differ from those like Section 8 in not being specifically targeted on housing problems of the poor; these can nonetheless have sizable impacts on the housing of the poor. Income is transferred to needy households through programs like AFDC, Food Stamps and Medicaid. Some of these additional funds can be used for housing expenditure, either directly as in AFDC, or indirectly by reducing the amount persons must spend of their own income on food and health care. Still other programs can alter the supply of housing available to poor households. New highways opening up suburban land and low interest rates reduce the costs of new housing. In the decades of the 1950s and 1960s these two factors fostered great quantities of new construction in the suburbs for high and middle income households, which in turn left a large supply of older existing housing for poorer households. High interest rates, environmental controls and land management planning in the 1970s have had the opposite effect, leaving the poor in a stepped up competition with the more affluent for existing dwellings.

In this chapter we simulate two potential federal programs which could, at least indirectly, have sizable effects on the housing conditions of the poor. The first is an income maintenance program, one of the options for welfare reform. It increases poor households demand for housing by increasing their total income. The second is a decrease in the mortgage interest rate for new housing construction. This could come about through a general reduction in interest rates as inflation abates, or as a specific spur for

the construction industry in response to its high unemployment. This program increases the supply of housing to poor households by increasing the total amount available throughout the market.

These programs are simulated in two of the prototypical cities used in the previous chapter's analysis of the Section 8 housing program. The cities, Cloth and Steel, both have large minority populations; but Cloth experiences rapid growth during the 1960s and Steel has slow growth. Additionally, the production of housing services from the existing stock of dwellings in Cloth is made responsive to changes in demand, i.e., it is elastic, while the existing stock in Steel is made inelastic. The high growth rate in Cloth makes the housing market tight, and its responsive stock means dwellings provide close to what each household wants at the market price. Together these factors imply that the existing stock will be extensively used and prices in Cloth will be high even in the absence of new programs. On the other hand, the slow growth and unresponsive stock in Steel means existing dwellings will be used at less than their capacity and will be priced low relative to new housing in the absence of additional housing programs.

The simulations are done for the 1960-70 decade, and are compared to the Section 8 simulations done over the same period. The characteristics assigned to Cloth and Steel bracket those existing in a great number of U.S. metropolitan areas today as well as during the 1960-70 decade.

The Income Maintenance Program

Under an income maintenance program subsidies would be larger than in direct housing assistance programs like Section 8. But unlike Section 8 the subsidies could be freely spent by the recipients. Major questions are how much of the income subsidies would be spent on housing, and what effect these

expenditures would have on the market.

Our income maintenance program guarantees everyone at least a poverty-level income. The subsidy equals the poverty level for households with no earned income of their own, and falls by 60 cents for every dollar of earnings. Families with 1969 incomes above $6,240 and single persons or elderly couples with 1969 incomes above $3,300 receive no subsidy.

The form of our income maintenance program is like many recent proposals for overhall of the welfare system. The Nixon administration's Family Assistance Plan was of this type, and the McGovern Campaign's demogrant proposal was similar. The government has begun several negative income tax experiments which use the same subsidy formula and the Brookings Institution's report on the 1975 federal budget includes a thorough discussion of a national income maintenance program and presents national cost estimates (done by the Urban Institute.)[1] The poverty line support level used in our simulations is at the high end of the range under discussion, but our simulations are done for SMSAs which have higher housing costs than nonmetropolitan areas.

Table 4.1 presents the results of the income maintenance simulations and compares them with the Section 8 programs simulated in the last chapter under proportional and the Fair Share fund allocation schemes. The income maintenance program is larger than either of the Section 8 programs. Subsidies average three to four times that in Section 8, and every household eligible for the program participates in it. Not all eligible households participate in the Section 8 programs because of the smaller subsidies and

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[1] Blechman, B., E. Gramlich and R. Hartman, Setting National Priorities: The 1975 Budget (The Brookings Institution, Washington, D.C. 1974) pp. 199-205.

Table 4-1

INCOME MAINTENANCE AND SECTION 8

Eligibles	Cloth (Rapid Growth, Elastic)			Steel (Slow Growth, Inelastic)		
	Income Maint.	Small Sec. 8[a]	Large Sec. 8[a]	Income Maint.	Small Sec. 8[a]	Large Sec. 8[a]
1. Percent of Households Eligible	26	10	20	24	12	18
2. Participation Rate among Eligibles	1.0	1.0	1.0	1.0	.50	.83
Recipients						
3. Average Subsidy ($)	102	24	43	116	33	34
4. Earmarking Ratio[d]	.15	1.03	.85	.18	1.40	1.04
5. Change in Expenditure (%)	20	23	45	40	57	65
6. Change in Housing Quality Index (%)	19	24	46	8	34	28
7. Change in Price (%)	2	0	0	29	16	29
Market-Wide						
8. Change in Price (%)	1	-2	0	6	-3	+3
9. Change in Withdrawals[b]	+3	+2	+4	+1	+1	+2
10. Change in Black Pop. in Zone 1[c]	-1	0	-2	0	0	0

[a] Small Sec. 8 refers to the proportional allocation Section 8 simulations and Large Sec. 8 refers to the Fair Share allocation Section 8 simulations. These are defined in the preceding chapter.

[b] The change in the number of withdrawals of model dwellings from a base of 31 in Cloth and 25 in Steel. Of necessity the change in withdrawals equals the change in new construction.

[c] Change in the number of black model households in the inner city zone from a base of 5 in Cloth and 4 in Steel.

[d] Ratio of change in housing expenditure to subsidy.

the imposition of minimum quality standards.

Of course, the larger income maintenance subsidies are intended to meet many needs other than housing, and indeed, the "earmarking ratio" shows that only 15 to 18 percent of the average subsidy gets spent on improved housing.[2] Under Section 8 most if not all of the typical subsidy goes to improved housing. Thus, in spite of the large subsidies of the income maintenance program, the increase in housing expenditures by recipients is moderately below that of Section 8 recipients.

An important contrast between the income maintenance and the Section 8 simulations is the way that increased housing expenditures get divided between improved quality and increased prices. For the Section 8 program quality improvements are as large or larger than price increases in both markets. However, under the income maintenance program in Steel quality improvements are less than a third as large as the price increase while in Cloth they are many times larger than the price increase.

The divergence in the effects on prices of the income maintenance program between the two types of markets is a major difference with the Section 8 program. Price changes are moderated across markets under Section 8 because some of the increased demand from the subsidies is offset by the increased supply

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[2]Two of the negative income tax experiments have been completed, but figures comparable to our "earmarking ratio" are yet to be calculated. The "New Jersey" experiment found an increase in home purchases among those eligible for the income subsidy, and a small effect on rent of those remaining as renters. The "Rural" experiment also found an increase in home purchases but no effect on the rents of those who remained renters. See Wm. Baumol, Journal of Human Resources, Vol. 9, No. 2 (1974) pp. 258-260, and Summary Report: Rural Income Maintenance Experiment (Washington, D.C.: U.S. Department of Health, Education and Welfare, November 1976) pp. 60-61.

from new construction. New construction is as common or more common under our Section 8 simulations than under the income maintenance program even though the income maintenance program covers more people and pays higher subsidies. This is because the simulated Section 8 program allocates half its funds to the leasing of newly constructed units. Housing improvement under the income maintenance program comes mostly from upgrading the existing stock. In Steel where the stock is comparatively expensive to upgrade but low priced to begin with, a moderate housing improvement comes with large price increases. Under Section 8 in Steel, much more housing improvement is obtained with no greater price increase.

The support given new construction by our Section 8 simulations increases withdrawals as well as moderating price changes. Steel, which grew little over the decade, already had a surplus of modest but adequate dwellings renting at low prices. The emphasis on new construction under Section 8 results in the substitution of more expensive new units for these existing dwellings. The situation is different in Cloth, where rapid growth over the decade leaves the market for existing housing tight and prices high. New construction is more likely there under either program.

Program recipients would undoubtedly prefer the income maintenance program over Section 8. The main reason is that its subsidies are three and four times as large. Another important reason, though, is that the Section 8 simulations force recipients to spend more of their subsidy on housing than they would like to, and there are no such restrictions in the income maintenance program. The Section 8 restrictions take the form of minimum quality standards for those in existing units, and the steering of others into new housing. Many households steered to new units not only have to spend all of their subsidy on housing, but have to increase the amount they previously were allocating to

housing from their own income. Clearly, recipients will prefer the unrestricted subsidies.

Market-wide, neither program causes large price changes in either city. What price changes there are tend to be confined to recipients, and these households are too few in number to have much influence on overall prices. There is a slight tendency for black households to move out of the inner city in Cloth under either Section 8 or income maintenance, and no movement in Steel. This difference across cities is partly due to the high relative cost of inner city housing in Cloth compared to Steel, which is itself due to the more rapid population growth and the more adaptable stock in Cloth than Steel. Another factor is the assumed building of some Section 8 housing outside the inner city.

Summarizing, just under twenty percent of the income maintenance subsidies in our simulations go to housing; but this is still enough to cause substantial increases in housing expenditure. The increased expenditure results in improved housing, although in a market with already depressed housing prices and an unresponsive stock, a majority of the increased expenditure goes to higher prices. The Section 8 simulations provide somewhat greater housing improvements for recipients in spite of their much smaller subsidies. This is accomplished through minimum quality requirements and the steering of recipients to new units. Of course, these restrictions make the Section 8 program less desirable to the participants. The emphasis on new construction in our Section 8 simulations does have the additional effect of moderating pressures for price increases that both programs create through their subsidies, but also leads to more withdrawals. Finally, neither program causes large market-wide price increases though they both increase the number of existing dwellings withdrawn from use.

The Mortgage Interest Rate Reduction

The second program considered in this chapter stimulates the supply of housing rather than its demand. It is a reduction in the mortgage interest rate for new construction. The size of the reduction is about 18 percent, for example, dropping from an 8 to a 6.5 percent interest rate. The reduction applies to all residential construction over the 1960-70 decade and would cost, according to our simulations, about the same as the large-scale Section 8 program simulated in the previous chapter.

This interest rate reduction program is unlike past housing programs as those tended to give much deeper subsidies to a limited number of dwellings. The Section 235 and 236 programs essentially reduced interest rates to one percent, and under the public housing program federal subsidies paid 90 percent of mortgage principle and interest. But under each program the number and value of units built was sharply circumscribed. Future programs could differ from the past, though, especially if they are intended primarily to stimulate employment in the currently depressed construction industry rather than to house the poor. The 1976 subsidy of $2000 for the purchase of a new home was of this type.

Past microeconomic policies have in fact produced conditions very similar to those created by our interest rate reduction program. The easy money and low interest rates of the 1950s and early 1960s kept the mortgage interest rate substantially lower than its current level; and, of course, it was available to all new construction over that period.

Subsidizing the mortgage interest rate essentially lowers the price of new housing. Since existing housing must compete with the new, the drop in the price of new housing will be reflected in the price of existing housing as well. Middle and upper income households will be directly affected, as

they occupy most of the newly built housing and the existing housing in direct competition with the new. But their moving to new housing will loosen up the supply of existing dwellings to lower income households, thereby affecting their housing conditions as well.

Table 4.2 compares the effects of the interest subsidy and the large, Fair Share Section 8 program in the prototypical cities of Cloth and Steel. The comparison includes the effect on the poorest 20-25 percent of the households--our target population--rather than the direct recipients of either program.

The principle effects of the interest rate reduction market-wide are an increase in new construction and a decrease in the cost of all housing. In Cloth new construction increases 70 percent and prices drop an average of 7 percent. In Steel, construction rises by 12 percent and prices drop by 8 percent. The increased new construction would over a period of a decade be accompanied by an equal increase in withdrawals of existing units as households move from the old to the new dwellings.

Surprisingly, housing consumption increases negligibly market-wide in both cities. Households apparently prefer to use most of their savings from reduced housing costs for other kinds of consumption.

The market-wide trends are reflected among the target population, even though none of these poorest households actually occupies a new dwelling. The excess supply of existing housing made available by middle income households moving to new housing is sufficient to reduce the housing costs to the target population by even more than in the rest of the market. Like other households, though, the poor increase their housing consumption little in response to the lower price. In Cloth the increase is a moderate 8 percent, but in Steel

Table 4-2

INTEREST RATE SUBSIDY AND SECTION 8

Target Population[a]	Cloth (Rapid Growth, Elastic)		Steel (Slow Growth, Inelastic)	
	Interest Subsidy	Large Sec. 8	Interest Subsidy	Large Sec. 8
1. Direct Subsidy ($)	0	33[b]	0	19[b]
2. Housing Expenditure Change (%)	-3	+30	-15	+43
3. Housing Quantity Change (%)	+8	+30	-3	+24
4. Housing Price Change (%)	-10	0	-13	+15
5. Moved to New Units	0	+4	0	+2
Market-Wide				
6. Housing Price Change (%)	-7	0	-8	+3
7. Housing Quantity Change (%)	+2	+4	+2	+2
8. Change in Withdrawals[c] and New Construction	+5	+4	+1	+2
9. Change in Black[d] Pop. in Zone 1	+1	-2	+1	0

[a]Target population is the lowest income 20-25 percent of all households.

[b]Subsidies were paid to 70 percent of target population in Cloth and 50 percent in Steel.

[c]The change in the number of withdrawals of model dwellings from a base of 31 in Cloth and 25 in Steel. Of necessity the change in withdrawals equals the change in new construction.

[d]Change in the number of black model households in the inner city from a base of 5 in Cloth and 4 in Steel.

consumption actually decreases slightly.[3] Thus, households in the target population also prefer to transfer savings on their housing costs to other consumption rather than spend it on better housing. This contrasts with the Section 8 program which, as noted earlier, induces a large increase in housing consumption among the target population.

A second contrast with the Section 8 program is the unevenness of effects across the two markets. In the rapidly growing market with an adaptable existing stock, the interest subsidy results in a large increase in new construction and a moderate improvement in the target population's housing. But in the slowly growing market with an unresponsive stock of existing dwellings, it causes only a slight increase in new construction, and the target population's housing shows no improvement. Section 8, on the other hand, leads to more similar amounts of new construction and housing quality improvements across the two markets.

The Section 8 and interest subsidy programs also differ in who occupies the new housing. Both programs emphasize new construction. Under the interest subsidy, none of the target population occupies new housing. But in the Section 8 programs most of the new dwellings built because of the program are occupied by target-population households.

Finally, there is a slight tendency for black households to move out of the inner city area in the Section 8 program, as some new Section 8 housing is assigned to other parts of the metropolitan area. The trend is reversed under the mortgage interest subsidy as a few black households move

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[3]The reason for the decrease in Steel is that poor households consume more housing than they want to in the absence of the program. The increased supply of existing dwellings caused by the new construction subsidy enables households to reduce their housing consumption to a more desirable level.

back into the inner city and a few whites leave it. Apparently the interest subsidy lowers all prices sufficiently for whites who want to leave the central area to go, and blacks who want to, to stay or return.

Overall Assessment

Comparing all three programs, the Section 8 program provides the most housing improvements for low income households per dollar of subsidy and does so consistently across markets. It does this through the housing consumption requirements it places on recipients and through leasing newly built dwellings. The income maintenance program also leads to considerable housing improvements but a much larger subsidy is required. The mortgage interest subsidy for new construction brings about the least improvement in housing quality, though it does bring about reductions in the price all households pay for their housing. The income maintenance program results in noticeable housing price increases for recipients when the existing stock is unresponsive to increased demands for housing improvements. The Section 8 program moderates housing price increases through increased new construction but also results in greater withdrawals of existing housing.

Among low income households the income maintenance program would be preferred because it provides more money and imposes no restrictions. How the target population would feel about the mortgage interest subsidy relative to assistance through the Section 8 program is unclear. From the interest reduction they mainly experience modest savings on their housing costs which they can spend as they please. From Section 8 they get larger subsidies, but they must spend it on increased housing.

Finally, in terms of economic efficiency, there is one drawback to the

mortgage interest subsidy. By lowering the price to consumers below the cost which must be paid to provide the housing, it encourages the production of more housing than is warranted, thereby drawing resources away from other uses and leading to the premature abandonment of existing dwellings. A similar waste occurs under the Section 8 program when new construction is favored over adequate existing dwellings, as occurs in our simulations in the slowly growing prototypical city, Steel. The income maintenance program avoids these losses because it does not subsidize or require new construction.

Chapter 5

Projections of Urban Housing in 1980

In this chapter we make two alternative sets of projections of how well urban households will be housed in 1980. The first set constitutes the "base case", done under the assumption of no new housing program initiatives in the 1970s. The second set of projections assumes a substantial Section 8 housing program--like that analyzed in Chapter 3--to be in place. By contrasting the two projections some light can be shed on the effectiveness of this program in alleviating what appear to be adverse housing developments over the 1970s in its absence.

To make these projections with the Urban Institute model required that 1980 values for a number of important variables be provided as inputs. Chief among these were the distribution of household incomes and input factor prices. Since these inputs were themselves projections for the 1970-80 simulations, whereas for the 1960-70 simulations their values were gotten from historical data, the results presented in this chapter are necessarily given with less confidence than those in the previous two chapters.

A. Urban Housing in 1980 Assuming No New Government Programs in the 1970s

The analysis of this section is designed to inform us of the progress or deterioration of the housing situation of urban dwellers which market forces--income and population growth, inflation in housing prices, and demographic trends--are producing in and of themselves. The results, then, provide some measure of need for government action. The results also give guidance on the context in which housing programs will be operating in the years ahead by developing information on the end-of-period stock--the amount of housing available at various quality levels and the amounts built and/or withdrawn from the active stock over the seventies.

The need for a projected assessment of the 1980 housing situation of all households, but especially those with low to moderate incomes, seems particularly urgent in light of the developments in the first half of the decade of the seventies compared to other recent experience. The tremendous improvement during the 1960s in the quality of housing occupied by the urban poor has been documented; over the same period Americans were devoting a smaller share of their income to housing than during the previous ten years.[1] Is this progress to be disrupted? In 1976 we know that household income corrected for inflation actually declined between 1970 and 1974, due to extremely high rates of inflation and a stagnant national economy. We also know that the prices of operating inputs for housing--such as utility costs and costs of home repairs--increased more rapidly than average price levels. The proportion of all urban households accounted for by single individuals, blacks and elderly whites has been rising. Obviously the likely events over the remainder of the decade must be considered, but already one has the feeling that the trends just listed and the drastic reduction in new residential construction in 1974-76 will leave their mark on the urban housing scene for years to come.

The Assumptions Underlying the Projections

The differences between the housing situation of urban families in 1970 and 1980 will obviously be driven by changes in the basic market forces, forces which are determined outside of the Urban Institute housing market model. In particular, values of three inputs must be provided to the model: the 1980 distribution of incomes of each household type, the demographic mix of households in 1980, and the average over-the-decade price of capital and

[1]See Part I in F. de Leeuw, A. Schnare, and R. Struyk, "Housing", in Wm. Gorham and N. Glazer (eds.) The Urban Predicament (Washington, D.C.: The Urban Institute, 1976), pp. 119-78.

operating inputs. The figures in Table 5.1 highlight the major differences in these market forces in the two decades. They are based on projections, detailed in Appendix C, which have been made using a variety of data sources and techniques. Overall, Table 5.1 shows:

- The rise in the price per unit of service of inputs for the production of housing services far exceeds the increase in the consumer price index in both decades. In the 1960s the price rise of capital inputs surpassed that of operating inputs; in the 1970s the opposite will be the case. Also, in the 1970s the overall increase in the price of housing inputs will be nearly double that of the 1960s.

- Average household incomes in the 1970s will rise by 17 percent <u>after</u> correcting for inflation--down about 30 percent from the 26 percent increase in the 1960s. In current dollars, on the other hand, average incomes will double over the seventies, compared with a 66 percent jump in the 1960s.

- The shift toward the elderly family/single individual household type will continue in the 1970s. Additionally, in the high-minority cities blacks will account for about 25 percent of all households in 1980 versus 20 percent in 1970. One effect of these changes will be to reduce the share of all households which are white nonelderly

families from 58 percent in 1970 to 50 percent in 1980.

- The divergence in growth rates between the cities classified in 1970 as slowly and rapidly growing over in the 1960s will be reduced somewhat in the 1970s as some rapidly growing cities reduce their growth rates and slowly growing areas increase their rates. In terms of total numbers of households, the rapidly growing areas will experience a 13 percent increase 1970-80 compared to a 25 percent increase 1960-70; for the slow growth areas there will be little change 1970-80 from the 8 percent increase of the 1960s.[2]

The facts just enumerated mean that there will be a reduced rate of real income growth, an increase in the relative as well as absolute price of housing, and a shift in the composition of households to those types which have had lower average incomes but which have traditionally devoted a larger share of their incomes to housing. Overall, one would clearly expect a reduction in the demand for the very large units and increased demand for smaller dwellings. Since a substantial majority of the dwellings providing low-to-moderate levels of services in 1980 will be those which were in the 1970 stock, a reduction in the rate at which older housing has been retired is anticipated as well. Much less clear a priori is how housing expenditures will be divided between the quantity of services consumed and the price of housing services or whether the division will be the same across income classes and/or household types. It is in this area and in quantifying qualitative assessments of expected change that the projections done with the model should be most enlightening.

Of equal importance to changes in these exogenous variables are possible changes in the behavior of producers and consumers over the period for which

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[2]For reasons outlined in Appendix C the convergence in model simulation results over the two decades will be somewhat greater than that due to the figures just noted.

Table 5.1

Summary of Changes 1970 to 1980 in Factors Affecting Housing Markets[a]

A. Composition and Incomes of Model Households 1960-1970

	Prototypical SMSAs with the High Minority Populations			
	Rapidly growing		Slowly growing	
	1970	1980	1970	1980
1. Distribution of model households by household type (percent)				
white nonelderly families	58	50	58	49
white elderly families and individuals	23	25	21	24
black nonelderly families	15	20	15	21
black elderly families and individuals	5	5	6	6
2. Mean income of model households by household type				
white nonelderly families	$13,006	$25,307	$13,006	$25,307
white elderly families and individuals	6,657	15,337	6,657	15,337
black nonelderly families	8,265	16,871	8,265	16,871
black elderly families and individuals	4,547	9,376	4,547	9,376

B. Average National Percentage Change in Factor Prices and Incomes, 1960-70 and 1970-80

	1960-1970	1970-1980
1. Percentage change in the price of inputs for producing housing services		
a. Capital inputs	68	76
b. Operating inputs	46	119
2. Percentage change in average household income		
a. Current dollars	66	99
b. Constant dollars	26	17
3. Percentage change in the Consumer Price Index	40	80

[a]Detailed explanations of the figures reported in the table are presented in Appendix A.

projections are being made. For most aspects of behavior embodied in the model, there is no simple way of determining if changes are underway. However, for one of the model's parameters--the ratio of housing expenditures to household income--there is comparatively current information available. An examination of the ratio over an extended period is quite revealing. The ratio declined over the 1950-70 period for nearly all of a group of narrowly defined household types. For all households combined, though, there was little change due to the shift of households from those types with low average ratios to those with higher average ratios. Over the 1970-73 period, by contrast, there was a fairly sharp upturn in the overall ratio.[3] Hence, at least in the short run, households have been willing to increase housing expenditures as a fraction of income to maintain their housing standard. It seems likely that this shift is not transitory, given that it applies to rental as well as owner-occupied units, since rental occupants could presumably shift quickly to lower quality units. As a consequence the housing expense-to-income ratios used in the model have been adjusted upward for the full 1980 simulations.[4]

As noted above, we have no basis for determining if other shifts in behavior are occurring in the present decade. Of special importance are the potential changes in the behavior of housing producers using the existing

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[3]The 1970-73 data are from G. Sternlieb, R. W. Burchell, and D. Listokin, "The Private Sector's Role in the Provision of Reasonably Priced Housing" (New Brunswick, N.J.: Rutgers University Center for Urban Policy Research, 1975). The 1950-70 pattern is documented in F. deLeeuw, A. Schnare, and R. Struyk, "Housing", op. cit.

[4]The ratios for all four household types were increased 20 percent, consistent with an assumption of the maintenance of a constant quality standard within each household type based on recent experience. The 1970 and 1980 ratios are:

Household Type	Housing expense-to-income ratios	
	1970	1980
white nonelderly families	.18	.22
white individuals & elderly families	.26	.31
black nonelderly families	.19	.23
black individuals & elderly families	.27	.32

stock. One might argue that their expectations might be significantly altered by the realization of the increased demand for existing relative to new housing. Improved expectations would lead to a greater output at every price. One can readily imagine homeowners deciding to improve their units instead of buying a new building. On the other hand, the increased number of communities imposing rent controls and the reduction in certain tax advantages to owners of rental housing clearly work to reduce expected returns. Overall expectations may be shifting differentially by tenure or by quality portion of the market, but we have no reliable way to tell. Without the requisite information we have chosen to assume that supplier behavior in the 1970s is identical to that in the 1960s.

Simulation Results

In examing the housing situation in 1980 we shall emphasize (1) the level of housing consumption and the proportion of income devoted to housing by various groups of households and (2) the extent of the utilization of the base year housing stock. For analyzing consumption, the quantity of service and the prices per unit of service are displayed for households in each income quartile in each decade. In addition, the percentage of households in each of our four household types (e.g., white, nonelderly families) living in substandard housing has been computed. The "standard dwelling" in these computations is one with more than the minimum quantity of services which would have been required to meet the standards for participation in a large-scale national housing allowance program in 1970.[5] To put this standard in perspective, note that it is somewhat

[5]The program referred to is a "housing gap" type allowance program in which 22 percent of households would be eligible for participation. The allowance payment to a household would be determined by the formula: $S = C^* - bY$. C^* is the maximum payment and is sufficient to provide a no-income household with standard housing; Y is income of the household; and b is the tax rate, the rate at which S^* is reduced by an increment to income. Other definitions of C^* are possible in the gap formulation, but the minimum standard unit has been used in the reference program. Separate C^*'s are used for non-elderly families on the one hand and elderly families and individuals on the other. This allowance program is the main one reported in Chapter 6 of deLeeuw-Struyk, op. cit.

below the standard required on new units by local building codes. Figures have also been compiled on the housing expense-to-income ratios for each income quartile and on the composition of the end-of-decade housing stock in terms of newly built and existing units. (For reference the mean and range of the 1970 household incomes in the four income quartiles are shown in Table 5.2).

The basic results of the 1970-80 simulations are presented in Table 5.3. As noted in Chapter 2, these simulations have only been done for the two high-minority prototypical cities (Cloth and Steel), a choice based on the greater diversity of results between city types associated with growth rates than with racial composition. Also, it will be recalled that the development of the high-minority prototypical cities involved using the same 1960 housing stock but different growth rates in low-to-moderate income households for the slowly and rapidly growing cities. As a consequence, the 1960 situation is the same for both the slowly and rapidly growing cities (during 1960-70) the figures in the left-hand column describe the 1960 or basic housing situation.

Because housing conditions in 1960 are based on historical (i.e., Census) data, we do not know the division of housing expenditures between the price per unit of service and the quantity of housing services. (The model makes this separation for the 1970 and 1980 results.) For the present computations the price per unit of service has been assumed to be the same throughout the market at a value of $1.00 in 1960. Thus all the prices in item 2 in the table are the same. This particular assumption implies strong demand for comparatively low quality units in 1960, an assumption consistent with several empirical studies.[6]

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[6]These studies have mostly been of the price paid by blacks for housing compared to white households in the same markets. They generally show a very tight market in the early 1960s (i.e., blacks paying more) and a much loser situation bt 1970 (i.e., blacks paying the same or less). For a review of these studies per A.B. Schnare and R. Struyk, "An Analysis of Ghetto Housing Prices Over Time", NBER, Conference on Income and Wealth, proceedings volume forthcoming.

Table 5.2

1970 Household Income Quartiles for High-Minority Prototypical Cities

(Incomes of 1970 Model Households)

	Income Quartile			
	lowest	2nd	3rd	highest
Rapid-growth				
Mean	$2,612	$6,894	$11,089	$21,190
Range				
lowest	1,003	4,784	8,760	14,194
highest	4,707	8,343	13,505	40,094
Slow-growth				
Mean	2,563	6,676	11,088	21,236
Range				
lowest	1,118	4,723	8,998	14,816
highest	4,559	8,215	13,940	37,939

Table 5-3

Housing in High-Minority Metropolitan Areas in 1980

Housing Indicator	All High Minority 1960	CLOTH: High growth-inelastic[d] 1970	1980	Percent Change 1960-70	Percent Change 1970-80	STEEL: Slow growth-elastic[d] 1970	1980	Percent Change 1960-70	Percent Change 1970-80	STEEL: Slow growth-inelastic[d] 1970	1980	Percent Change 1960-70	Percent Change 1970-80
1. Average quantity of housing services													
lowest income quartile	43	58	60	35	3	59	66	37	12	59	65	37	10
2nd income quartile	77	96	108	25	13	96	112	25	17	96	112	25	17
3rd income quartile	105	140	170	33	21	135	165	29	22	136	168	30	24
highest income quartile	167	208	231	25	11	216	232	29	7	205	231	23	13
2. Average price of housing services[f]													
lowest income quartile	1.00	1.02	2.32	2	127	1.10	2.59	10	135	.83	2.02	-17	143
2nd income quartile	1.00	1.24	2.58	24	108	1.21	2.61	21	116	1.20	2.44	20	103
3rd income quartile	1.00	1.24	2.73	24	120	1.24	2.73	24	120	1.24	2.67	24	115
highest income quartile	1.00	1.24	2.77	24	123	1.22	2.76	22	126	1.23	2.75	23	124
3. Average housing expense-to-income ratio[g]													
lowest income quartile	.22	.28	.39	27	39	.30	.47	36	57	.23	.36	5	57
2nd income quartile	.20	.21	.27	5	29	.21	.30	5	43	.20	.26	0	30
3rd income quartile	.19	.18	.23	-5	28	.18	.22	-5	22	.18	.22	-5	22
highest income quartile	.19	.15	.19	-21	27	.15	.19	-21	27	.14	.19	-26	36
4. Percent of model households in "substandard" housing[a]													
white													
nonelderly families	15	9	9	-10	0	5	5	-67	0	5	5	-67	0
individual & elderly family	57	22	8	-41	-64	14	11	-75	-21	14	11	-75	-27
black[b]													
nonelderly families	67	17	22	-75	23	20	29	-70	45	0	14	-100	e
individual & elderly family	0	--	50	0	e	--	50	--	e	0	50	--	e
5. Household and dwellings													
a. No. households		40	46			33	36			33	36		
b. No. of new units		12	7			5	3			8	6		
c. No. of units[c]													
i. Start-of-decade		31	40			31	33			31	33		
ii. Start-of-decade units in occupied stock at end-of-decade		28	39			28	33			25	30		

[a]The minimum quantity of services for a unit to be classified as standard is defined as the same as required for a household to have consumed to be eligible for participation in a national housing allowance program in 1970. Separate quantities are defined for (a) nonelderly families and (b) elderly families and single individuals.

[b]The numbers in these rows should be viewed with caution because the small number of black model households in the cities.

[c]The difference between i and ii is the number of dwellings withdrawn from the stock over the decade.

[d]Differences in the elasticity of supply are differences in the responsiveness of those producers using the stock of housing present at the start of the simulation period to changes in the price referred to them by consumers. In the elastic case this responsiveness is 1.4 times that in the inelastic case.

[e]Not defined.

[f]The price per unit of service in 1960 is $1.00; for a new unit over the decade of the 1960s, $1.24; over the decade of the 1970s, $2.78.

[g]Household incomes are exogenous to the model but the housing expenses of the individual households are determined as a part of the model solution.

To the right of the results for 1960 four columns of information are shown for each city and each assumption about producer responsiveness, i.e., the standard elastic vs. inelastic distinction. The 1970 and 1980 housing situations are described both in terms of the level of consumption, housing prices, and other factors and in terms of the percentage change in these factors over the decade ending in these years.[7]

Turning first to the change in the quantity of housing consumed between 1960-70 and 1970-80, item 1 in the table shows that even with the assumed increased expenditure on housing, there will be deterioration compared to the progress of the sixties. Note, though, that the housing situation of all groups improves over the decade, albeit at a slower rate than over the 1960s. The decline in growth appears to be sharper in the high growth city under the inelastic supply assumption (first set of columns) than in the parallel slow-growth situation (last columns). This might be expected since there was substantially less underutilized stock present in the fast growing city in 1970. Further, between the elastic and inelastic cases for the slow-growth city, there will be a slightly greater decline for the lowest income households in the inelastic case. This result stems from the relative inability of producers using existing dwellings to modify their units to satisfy a shift in demand in the inelastic case. It takes a major price increase to induce such changes and households end up reducing the amount of housing they purchase or, for the more affluent, shunning some of these relatively expensive existing units in favor of new housing.

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[7]The reader may note that no results are presented for the high-growth elastic case. We were unable to obtain solutions which met the standard criteria for this case. To obtain solutions it was necessary to assign two high and moderate income households to new units.

The role of increased factor prices relative to real income growth is evident, particularly in the prices paid by the lowest income quartile households. For these households new units with their high minimum requirements are prohibitively expensive. Over the 1960s low income households generally faced little increase in the price per unit of housing services--the maximum increase was 10 percent in Cloth. This was due mainly to the large amount of new construction made possible by the combination of favorable capital cost conditions, the substantial growth of real incomes, and the reduction of in-migration to many cities at the decade's end. Thus the supply of lower quality units was increasing in the face of declining demand. The 1970s are to witness a strong revival in demand for smaller units in response to higher prices and increased numbers of households with modest incomes--the latter resulting from changes in household composition. Note that the demand will be for those smaller existing units which have not been destroyed, which are typically in better condition than those which have been dropped from the stock. The result will be price pressure for smaller units: where the discounts were deeper, the pressure will be greater, since prices can rise further before they compete with units in other segments of the market. Steel under the inelastic supply assumption provides a dramatic case of this where prices rise from a deep discount in 1970.

The effect of high factor prices are also demonstrated in the pattern of utilization of the base year housing stock at the end of the respective decades. Over the 1960-70 period both cities, under both elasticity assumptions, retired at least 10 percent of the base year dwellings from the stock (the difference between items 5ci and 5cii), with the slow-growth city under the inelastic supply assumption retiring the largest share. But for 1970-80, the rate of retirements will fall sharply as a greater demand for existing units will be spurred by the high price of new units; in the Steel elastic

case no model dwellings will be retired and in the Cloth inelastic case only about 2 percent of the base stock will drop out. But in the Steel inelastic case about 7 percent of the stock will still be retired. Overall, then, a sharp reduction in housing abandonments and lower vacancy rates are expected generally in 1980 compared to 1970; but in some markets they may continue to be problematic.

While the points just made establish the general picture, care must be taken to sort through some of the patterns being observed. In particular, the reduction in the improvement of housing quality by households in the lowest income quartiles in both cities is due not only to the general shift in housing prices relative to incomes but to shift of households to the lower income household types. The figures in item 4 of the table are designed to disentangle what happens to households of individual household types. In addition, by measuring their progress relative to a minimum quantity requirement for the dwelling occupied to be considered a standard dwelling, the degree to which households will be forced below this standard by 1980 by economic conditions can be observed. The pattern for the two white household types is quite clear: there will be a decline in the rate of progress in moving households into standard quality housing, but there will be no increase in the fraction of households in substandard units, i.e., the gains of the past will not be lost.

The results for the two black household types need to be interpreted with considerably more caution. Because of the small number of black model households--2 elderly families/individuals and 4-9 nonelderly families--a change in a single model household can overstate what might actually be happening. This "discreteness" problem is evident for the 1960 results which show no black elderly families/individuals living in substandard units.

Looking at the results for blacks as a whole, it appears that more blacks could live in substandard housing in 1980 than in 1970, unless they are willing to devote an even higher proportion of their incomes to housing than we have assumed.

Lastly, we turn to the fraction of their incomes which households are spending on housing (item 3). The results of the simulations for the 1970-80 period show substantial increases in the housing expense-to-income ratios for all income quartiles, as they should, given the increase in the corresponding model parameter. The distribution of the rise in the ratio by income class, though, is not preordained. Similar to the pattern of increases observed for the 1960s, the lowest income group experiences the largest increase in housing expense-to-income ratios. This increase of about 40 percent in the ratio of the poor is caused by the competition for smaller dwellings. The ratios of the rich also rise a good deal because of the jump in the price per unit of service of new dwellings.

The picture for the decade of the seventies, then, is not as bright as that for the 1960s. While most households will be better housed in 1980 then they were in 1970, the rate of improvement will have been seriously attenuated. Among urban blacks there is the distinct possibility that more will live in substandard dwellings in 1980 than in 1970. Households of all income levels will be devoting a greater share of their incomes to housing. The situation of those living in cities which grew more rapidly than the national norm during the 1960s, and hence entered the seventies with tight housing market conditions, will improve less than for those living in the slower growing areas with a larger proportion of the 1970 stock not fully utilized.

Preliminary Assessment

The results just reviewed indicate fairly sharp shifts in the housing situation in 1980 compared to that in 1970. The credibility of these findings depend on how well the exogenous inputs have been predicted for 1980 and on the functioning of the model itself. Besides reviewing these factors, however, it is possible at the end of 1976 to confront the full set of predictions with data from the first few years of the decade. We shall see, though, that due mainly to our ignorance concerning the timing of various behavioral responses it is difficult to make this type of confrontation very definitive.

Three types of information are available for our comparative purposes, data on housing quality, on maintenance and improvement expenditures made for existing units, and on the rate of appreciation of owner-occupied houses and the rents of rental properties. Some summary figures on each of these factors are given in the three panels of Table 5.4 for the 1970-1974 period.

Panel A provides a number of conventional measures of the amount and quality of housing being consumed by households living within metropolitan areas. These data, drawn from the Census of Housing and the Annual Housing Survey, overall indicate a steady increase in the average quality of housing between 1970 and 1974. Interestingly, there has been little change in the distribution of dwellings by the number of rooms or bedrooms which are useful proxies for size. Any attempt at a pricise comparison of the rate of improvement in these quality indicators over 1970-74 with that over the 1960s is fraught with problems of incomparability in definitions of the included areas and data availability. But our general assessment is that the two trends are roughly comparable. On the other hand, the figures on the percentage changes in expenditures by owner-occupants and landlords over the 1968-1974 period shown in Panel B exhibit a sharp downturn in the seventies when deflated for price

Table 5.4

Indicators of Trends in Housing Quality and Prices in the Early 1970s

A. Selected Physical Attributes of Dwellings in SMSAs[a]

Attribute	Year 1970	1973	1974
1. Distribution of number of Rooms (percent)			
1-2	6	5	5
3-4	32	32	32
5-6	44	44	44
7 or more	17	18	18
2. Distribution of Number of Bedrooms (percent)			
None	3	3	3
1	18	17	17
2	33	32	33
3 or more	47	48	47
3. Distribution of Number of Bathrooms (percent)			
1	} 77	64	62
1 and 1/2		12	13
2 or more	18	21	22
None or shared	4	3	2
4. Distribution of Heating Equipment (percent)			
Central System	74	79	80
Other	26	21	20
5. Percentage of units with air conditioning			
Central System	27	31	31
Window Units	12	19	21
6. Percentage of units with			
a. Interior walls and ceilings			
i. open cracks or holes			
owner-occupied	b	3	3
renter-occupied	b	11	10
ii. broken plaster or peeling paint			
owner-occupied	b	2	2
renter-occupied	b	9	8
b. Interior floor has holes			
owner-occupied	b	1	1
renter-occupied	b	3	3
c. Roof leakage			
owner-occupied	b	5	4
renter-occupied	b	9	8
d. Exposed electrical wiring			
owner-occupied	b	3	2
renter-occupied	b	4	3
e. Auxiliary heaters used due to poor heating			
owner-occupied	b	7	6
renter-occupied	b	15	15

Table 5.4
(continued)

B. Trends in Maintenance and Investment Expenditures on Residential Properties[c] (percentage increases)

Tenure-dwelling type	Period 1968-1970	1970-1972	1972-1974
1-unit owner-occupied			
current dollars	55	18	22
constant dollars	39	5	1
Rental properties			
current dollars	16	25	17
constant dollars	4	12	-3

C. Changes in Housing Rents and House Values, 1970-1974[d]

	Percentage change 1970-73		Percentage change 1973-74	
	Central Cities	Suburbs	Central Cities	Suburbs
Median Value of Owner-Occupied Units	36	42	11	10
Median Gross Rents of Rental Units	22	25	8	6

[a]Figures taken from the 1973 and 1974, U.S. Bureau of the Census Annual Housing Survey, Part A, "General Housing Characteristics," and Part B, "Indicators of Housing and Neibhborhood Quality," H-150-7nA and H-150-7nB Series (Washington, D.C.: U.S. Government Printing Office).

[b]Data not available for 1970.

[c]Figures taken from U.S. Bureau of the Census, Residential Alterations and Repairs, Series C50 (Washington, D.C.: U.S. Bureau of the Census, various issues). Current dollar amounts in the C50 Series were deflated with the Department of Commerce construction price index to obtain the constant dollar figures.

[d]From Franklin James, "Housing Reinvestment and the Central City: The Future of Older Urban Housing," (Washington, D.C.: Urban Institute Working Paper 241-02, 1976).

increases.[8] For owner-occupied units the reduction occurred at the beginning of the decade, while for rental properties the shift happened after 1972. The point, however, is that with these expenditures holding essentially constant, the main source of improvement in housing quality will be the addition of new units to the stock and the withdrawal of the worst quality existing dwellings.

The evidence on consumption and investment, on balance, does not paint a clear picture. Some improvement is consistent with the predictions made. In fact, a sharp improvement in the early years of the decade would not necessarily be incompatible with the predictions. There is a general consensus that housing consumption decisions are based on normal or long-run income, and this consensus is built into the model. No reliable information has been developed on the length of time required for families to revise prior estimates of their normal income. In other words, most households may have been using their lates 1960s normal income expectations to guide their housing consumption in the early 1970s. This would especially be the case if the inflation and recession associated with the oil embargo and the grain shortages were viewed at the time as extraordinary events. With expectations just being revised, say, in 1974-75, the main impact on housing trends will show up in the years immediately ahead.

The final piece of information which we can muster is on the average rates of appreciation of owner-occupied housing and the rates of rental increase of dwellings of different ages and at alternative locations in metropolitan areas. These comparisons are fairly crude in that they are predicated on older dwellings and dwellings located in central cities providing a smaller quantity of housing services than their newer or suburban counterparts. These data, shown in Panel

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[8]This data series was only begun in 1968 so longer-term comparison are not possible.

C of Table 5.4, indicate the 1970-73 pattern to be similar to the one observed over the 1960s of newer and suburban properties having higher rates of rental increase or property appreciation than others. For 1973-74 the pattern reverses itself with older and central city dwellings doing better--a pattern consistent with some time lag being required before the price pressures from the high costs of new dwellings working themselves through the market. In addition, James has found that the expenditures on maintenance and improvement of existing units has been differentially greater for older and central city units.[9] While it is clearly too early to assert that these data confirm anything about the predictions given by the model, they do demonstrate their plausibility.

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[9] Franklin J. James, " Housing Reinvestment and the Older Central City: The Future of Older Urban Housing", (Washington, D.C: Working Paper 241-02, 1976).

B. Section 8 in the Decade of the 1970s

Against the background of the housing situation in 1980 in the absence of major government initiatives, the potential importance of the Section 8 program in further improving the housing quality or lowering the rent burden of the poor is obvious. The Section 8 program reviewed here is similar to that explored in considerable detail in Chapter 3. In particular, a program leasing half new-built and half-existing units was simulated for Cloth and Steel, under the assumption of inelastic supplier response. The program involves the same number of households as the 1960-70 Section 8 program under the Fair Share Allocation in these cities. The 1970 Fair Market Rents have been increased to reflect the estimated increase in the price of housing services over the 1970s; income eligibility limits were similarly increased. On the other hand, the minimum housing quality standards for participation and general eligibility criteria are the same as those used in Chapter 3.

Several events over the 1970s could alter the effectiveness of the program, compared with the results reviewed for 1960s. A major factor is the steep rise in the price of housing services to the poor in the absence of the program. This rise largely accounts for the increase in the rent-burden of the poor. Since most poor would be devoting well over 25 percent of their incomes to housing, participation should increase. A major effect of the program should be reductions in their housing expense-to-income ratios. At the same time, urban households were generally better housed in 1970 than they were in 1960. Among those moderate income households who are income-eligible for program participation, some may have increased their housing consumption beyond the limits imposed by the Fair Market Rents. Even though this high standard has

been achieved only by devoting over a quarter of their income to housing, they may elect to live in these dwellings than to participate in the program.

The results of these simulations are presented in Table 5.5. The results are given for households divided by income quartiles. Eligible households are concentrated in the lowest quartile, although a few are in the second quartile. Looking first at participation rates, one sees that full participation was achieved. We should note, however, that a solution could not be obtained for the high growth city under the 50 percent new-50 percent existing program because of competition among those eligible households not "assigned" to new units for existing dwellings meeting the program standards.[10] The results in the table are for a 60 percent new construction and 40 percent existing mix of units based under Section 8. The problems of obtaining a solution reflect an important point: it may be extremely difficult to rely on existing housing for a major contribution to the program in rapidly growing areas. The full participation in Steel is in contrast to the findings for the 1960-70 period, and is due to the greater relief of housing expense burdens the program offers in the decade of the 1970s.

Housing consumption rises for the lowest income quartile by about 10 percent under the program (item 4 in the table); and the increase for participating households is about the same. The increases for the lower two income quartiles are produced by the combination of direct increases by participants and other increases made possible by the market effects of the program. Consumption of nonparticipants increases more in Cloth because of the

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[10]The reader will recall from Chapter 3 that in most of the simulations some eligible households were assigned to new units--the equivalent of local housing authorities steering households--since in a strict utility maximizing framework new units would not have been chosen under the 1960-70 conditions. We have not investigated this point for 1970-80.

Table 5.5 The Effects of Implementing a Major Section 8 Housing Program on the Housing Situation in High Minority Cities in 1980[a]

	Rapid Growth-Cloth			Slow Growth-Steel		
	Without Section 8	With Section 8	Percentage Change	Without Section 8	With Section 8	Percentage Change
1. Participation rate	--	1.00	--	--	1.00	--
2. Average Subsidy	--	$50	--	--	$76	--
3. Earmarking Ratio[b]	--	.57	--	--	.91	--
4. Average quantity of housing services						
lowest income quartile	60	65	8	65	72	11
2nd income quartile	108	119	10	112	113	1
3rd income quartile	170	166	-2	168	162	-4
highest income quartile	231	233	1	231	229	-1
5. Average price per unit of housing services						
lowest income quartile	2.32	2.15	7	2.02	2.14	6
2nd income quartile	2.58	2.60	1	2.44	2.57	5
3rd income quartile	2.73	2.73	0	2.67	2.68	0
highest income quartile	2.77	2.77	0	2.75	2.75	0
6. Average housing expense-to-income ratio						
lowest income quartile	.39	.31	-21	.36	.33	-8
2nd income quartile	.27	.25	-7	.26	.23	-12
3rd income quartile	.20	.19	-5	.20	.19	-5
highest income quartile	.19	.20	5	.19	.20	5
7. Number of model dwellings present in 1970 withdrawn by 1980	1	6	--	0	5	--
8. Number of model dwellings built 1970-1980.	7	12	--	3	8	--

[a]The Section 8 program is that described in Chapter 3 as using a 50 percent new construction-50 percent existing mix with the number of eligible households determined by the Fair Share Allocation. For Cloth the results are for a 60 percent new-40 percent existing unit; see text for explanation. All results in the table are based on the assumption of a relatively inelastic responsiveness by suppliers using the existing housing stock to changes in demand.

[b]The earmarking ratio is defined as the dollar change in housing expenditure over the cost of the subsidy. It is defined only for participating households.

construction of new units under the program produces a general loosening of the tight initial market conditions and prices faced by the poor declines.

In Steel new construction does not cause this favorable price effect. Here the initial price level is much lower (relative to the price per unit service of new construction which is the same in both cities). Some existing dwellings as a consequence are producing few housing services at the time the program is introduced. It is necessary for the price of these units to rise if they are to be improved enough to meet program standards. The competition among participants is sufficient to do this, except in the case of the lowest quality unit which no household chooses and which is therefore withdrawn from the stock. The overall result is the seemingly paradoxical outcome of increases in consumption and the price per unit of housing services both increasing--a result indicating the importance of the implicit income gains by participants and the market-wide program effects. An additional effect of this combination is the higher earmarking ratio in Steel than in Cloth.

Finally, we note the change in the ratio of housing expense-to-income of participants. These ratios without the program were .31 and .38 in Cloth and Steel, respectively. The lower value in Cloth reflects our selection of households with high incomes (compared to all income eligible households) for newly built units since the large size of new units would be closer to the size of dwelling chosen by these households than by lower income households if they were given a cash transfer. In Cloth, 10 percent more of the units leased under Section 8 are newly constructed. The housing expense to income ratios of participants under the program are .25 by definition. Hence, in Cloth, their average rent-burden declines by 19 percent and in Steel by 34 percent. These represent major improvements in the welfare of participants

not elsewhere reflected in the results.[11]

While these simulations are certainly too few to allow one to draw conclusions with substantial confidence, three general observations seem warranted. First, even a large-scale Section 8 program will in general cause only small market disruptions; a possible exception is excessive use of existing units in rapidly growing areas. Second, the program will increase housing consumption of participants modestly and, under some market conditions, that of nonparticipants as well. Third, a major effect will be a reduction in the housing burden of participants, an effect which could be achieved through other types of transfers.

[11]This phenomena has been observed in the early experience under the Section 8 program, under the Loan Management Set Aside under which Section 8 subsidies are given to households living in FHA-insured (and often government subsidized projects) potentially in danger of default. The main effect on tenants of these projects, at least in the short term, has been the reduction in rent burden. For details, see "Section 8 Housing Assistance Payments Program: The Loan-Management Set Aside," (Washington, D.C.: Office of the Assistant Secretary for Policy Development and Research, U.S., Department of Housing and Urban Development, 1977).

Chapter 6[1]

Which Housing Policy Is Best?

The answer to the question posed in the title of this chapter--which housing program will be best in an urban area--has been the theme of this book: it depends. It depends on which specific objectives are weighted most heavily, on the conditions in the housing market at the time the program is introduced, and on the trends in incomes, growth in the number of households, and the price of inputs for producing housing. There is no single answer, then; and, indeed, there may not be a single answer for each metropolitan area.

We do not attempt to define "the best policy". Rather we contrast the long-term effects of a large number of alternative policies on how well people are housed and the condition of the stock under different market conditions. The procedure in this chapter contrasts with that used in the previous chapters where the effects of a single program were compared across cities. Here the effects of alternative policies in the same market are contrasted and then compared with the effects of the same set of policies in another type of market. An illustration of the question being addressed is: Which policies are more effective in rapidly growing cities? In earlier chapters the question was, for example, what are the effects of the Section 8 program in different cities?

More specifically, the effects of ten housing programs in each of two of the prototypical cities are examined. The two cities are the high-minority, rapidly growing, low-to-moderate-income population (Cloth) and the low-minority, slow growth in the low-to-moderate-income population (Grain). These cities represent two extremes out of the four cities and should provide a sharp contrast. For Cloth the assumption is of relatively high responsiveness to demand changes on the part of suppliers using the existing housing stock; in Grain the

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*With Michael S. Owen

inelastic assumption is used. This divergence in supplier assumptions heightens the contrast between the two types of cities. The programs include those discussed in detail in prior chapters (Section 8, a major welfare reform, new construction subsidy) as well as a housing allowance, a smaller income maintenance program, combinations of housing allowances and new construction capital subsidies or rehabilitation subsidies, new conventional public housing and independent capital subsidies for new residential building.

There are clear limitations to the analysis presented in this chapter. Only results for some types of cities are included. More importantly, some of the programs themselves are not strictly comparable: they differ in their aggregate cost, in their coverage, and in their workings. Further, any comparative analysis of housing programs is plagued by the multiplicity of objectives which these programs attempt to serve. Finally, we have been unable to develop a single, comprehensive measure of the benefits which programs provide, despite substantial effort.[2] This means that in comparing the effects of the programs it is necessary to consider a fairly large number of indicators. Despite these shortcomings the comparisons do permit broad conclusions about program effectiveness.

The Programs

A concise summary of the ten programs included in this analysis and provided in Table 6.1. There are only four types of programs among the ten which have not been treated at length elsewhere in this volume: housing allowances, targeted capital subsidies for new construction, construction of conventional public housing and rehabilitation subsidies.

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[2]For a full discussion of the problems entailed in constructing a comprehensive benefit-cost measure, see L. Ozanne, "Calculating Benefit-Cost Ratios with the Urban Institute Model," (Washington, D.C.: Urban Institute Working Paper 235-3, 1977).

Table 6.1 Summary Description of Housing Programs Compared[a]

Type of Program	Program Description[b]	Conditions for Participation
1. Housing Allowance	Cash grants to households earmarked for housing, 22 percent of households eligible. Subsidies determined under "housing gap" formula: $S = C^* - .2Y$ where C^* is cost of dwelling and Y is household income.	Income test: $Y \leq C^*/.2$; implies income limits of $5,000 for nonelderly families and $4,000 for elderly families and individuals. Housing consumption requirement: nonelderly families must occupy dwellings providing at least 65 units of service per month; elderly families and individuals, 54.
2. Small Income Maintenance Program	Unrestricted cash grants to 22 percent of households. Transfer payments determined by the housing allowance gap formula.	Income test as above. No minimum housing consumption requirement.
3. Major income maintenance program	Unrestricted cash grants to 27 percent of households. Transfer payments determined as $S = P - .6Y$ where P is the maximum payment and equals the 1969 poverty income definition, defined separately for nonelderly families versus elderly families and individuals. The .6Y term indicates that S is reduced by 60 cents for every dollar of addi tional income.	Income test: maximum incomes for nonelderly families, $6250; for elderly families and individuals, $3300.
4. Across-the-board new construction subsidy	Subsidy available on all new residential construction of 12 percent of the cost of capital.	No special requirements. Unit must meet building codes and, hence, provide at least 65 units of service per month.
5. Targeted (1-step) new construction subsidy	Thirteen percent subsidy on capital costs of dwellings providing less than 200 units of service per month. Maximum corresponds roughly to $24,000 dwelling.[a]	Dwellings must meet minimum standards and provide no more than 200 units of service per month.

Table 6.1 (Cont.)

Type of Program	Program Description[b]	Conditions for Participation
6. Targeted (2-step) new construction subsidy	Subsidy of 21 percent available to newly constructed dwellings providing 65-150 units of service per month and of 11 percent for units in 150-200 quantity of service range. Dwellings of 150 units of service cost roughly to $18,000.	Only quantity of service requirements noted in program description.
7. Combined housing allowance and 1-step new construction subsidy.	Small housing allowance, with 11 percent of households eligible. Gap type program (see 1 above). 1-step construction subsidy as described above, except subsidy is 9 percent of capital costs.	Allowance income tests: income maximums are $2900 for nonelderly families and $2050 for elderly families and individuals. Housing consumption requirements: non-elderly families must consume at least 48 units of housing services per month; elderly families and individuals, 34. Restrictions on supplier subsidy: same as in 5, above.
8. Combined housing allowance and rehabilitation subsidy.	Housing allowance program with 16 percent of households eligible. Gap type program (see 1 above). Price paid by landlords using the existing housing for capital services to make improvements is reduced.	Allowance income limits: nonelderly families, $3800; elderly families and individuals, $3000. Housing consumption requirements: nonelderly families must consume at least 63 units of housing services per month; elderly families and individuals, 54. Depth of suppliers' capital subsidy varies with pre-subsidy housing output; deepest for units close to quantities required by housing allowance program.

Table 6.1 (cont.)

Type of Program	Program Description[b]	Conditions for Participation
9. Section 8 Housing Assistance Plan	10 percent of households eligible. Government leasing 50 percent newly constructed and 50 percent existing dwellings. Household contributes 25 percent of its income.	Income test: income limits vary with family size and are expressed as functions of local area median income. Consumption/supplier requirements: new dwellings must provide 65 units of service per month; existing, 45. Dwellings must not rent for more than Fair Market Rent established separately for new and existing dwellings.
10. Public housing	Conventional public housing. Enough new units built for 5 percent of population. Household contributes 25 percent of income to live in public housing unit.	Income test: household income cannot exceed 80-90 percent of the Section 8 income limits.

[a] All dollar figures are in 1970 dollars.

[b] More complete descriptions of these programs are available as follows: 22 percent housing allowance program, small income maintenance program, and across-the-board new construction in Chapter 6 of de Leeuw and Struyk, The Web of Urban Housing, op.cit.; the one and two-step new construction programs, with and without housing allowances, in M. Owen and R. Struyk, "Market Effects of New Construction Subsidy-Housing Allowance Programs," (Washington, D.C.: Urban Institute Working Paper 221-4, 1975); the rehabilitation-allowance combination and related programs, in L. Ozanne, "Housing Allowances in Combination with New Construction and Rehabilitation Subsidies," (Washington, D.C.: Urban Institute Working Paper 221-9, 1975); the Section 8 program in Chapter 3 of this volume; and the major income maintenance program in Chapter 4 of this volume.

A housing allowance is a cash grant given to income eligible households subject to the condition that the household live in housing of a certain quality. The particular type of allowance program included is of the "gap type," under which the cash grant received (S) equals the difference between the monthly rent of a dwelling meeting program standards (C*) and 20 percent of the household's income (Y).[3] To receive the grant the household must occupy housing at least meeting the physical standards, although the dwelling may rent for more or less than the C* amount. If it rents for less, the participant is allowed to keep the difference--a significant shopping incentive. Because of the requirement to occupy standard quality housing, one expects housing demand by program participants to be concentrated just above the program standard. Such a concentration can be expected to cause housing prices per unit of service to rise, unless the supply of suitable housing is increased through other actions.

The national prototype program simulated would make about 22 percent of households income eligible. Of all the programs included, the housing allowance program is the only one for which we have reliable national cost data. It is estimated that in 1976 an allowance program similar to the one used here would cost about $7.6 billion in transfers and perhaps another $1 billion to administer.[4] This figure serves below as a benchmark against which to measure the probable costs of other programs.

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[3]For a general description of alternative housing allowance formulations see F. de Leeuw, S. H. Leaman, and H. Blank, The Design of a Housing Allowance (Washington, D.C.: The Urban Institute, 1970).

[4]R. Sepanik, "Variations of Selective Design Elements for Housing Allowances: Simulations Using the TRIM Model," (Washington, D.C.: Urban Institute Working Paper 216-19, 1975).

The across-the-board new construction subsidy, number 4 in the table, is a subsidy to the cost of capital. It would be available to all newly built housing, regardless of the cost of the unit or the income of the occupant. Such a policy could be implemented, for example, by a federal interest subsidy, perhaps lowering the mortgage interest rates paid by occupants of new units by one percentage point. The 1-step and 2-step construction subsidies, numbers 5 and 6 in the table, place restrictions on the size or cost of dwellings qualifying for the subsidy, thereby targeting the subsidy to moderate income households. The 2-step offers a deeper subsidy to new units reasonably similar to those qualifying under the Section 235 homeownership assistance program, compared to that offered to better but still modest new dwellings. All of these programs will tend to cause additional new housing to be built and should therefore produce an excess supply of units in the lower-income portion of the market.

The rehabilitation subsidy which is combined with a small housing allowance (number 8) provides a subsidy to capital used in improving the dwelling unit. In the particular program used here, the depth of the subsidy varies depending on the beginning of period output of the dwelling. The capital price reduction is greatest for dwellings producing levels of housing service in 1960 near the housing allowance-required minimums, and the reduction declines as dwelling size increases. This design works to augment the supply of allowance-acceptable units in the critical range and hence should offset inflationary pressures caused by the allowances. No current program has the flexibility of this rehabilitation subsidy--either in terms of the depth of the subsidy nor in permitting modest as well as substantial rehabilitation.

Conventional public housing is similar in some ways to new housing built under the Section 8 Housing Assistance Program. In both programs participation is income conditioned and the household is required to spend a quarter of

its income on rent in exchange for living in a unit meeting program standards. The construction and management of public housing is the responsibility of a Local Housing Authority, and the Federal government provides a subsidy for 90 percent of the construction costs and some operating cost subsidy as well. Under Section 8, on the other hand, there is only a long-term lease arrangement by the local community with the owner of the new rental property, guaranteeing payment of rent if a participating household chooses a unit in the property.

The particular program designed here has new public housing units equivalent to about 5 percent of the base year stock built over the decade being simulated. Very low income households are assumed to be the occupants of these additional units.[5] Because of their low incomes and the high standards which public housing has often embodied, the improvement in the housing position of participants should be very large.[6] The average subsidy payment will consequently be large. One would expect additional public housing to have

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[5] Based on income figures for public housing tenants compiled for 1976 and deflated to 1970 (the terminal year in our simulation runs), we estimate that about 40 percent of public housing tenants currently would be "very poor," (i.e., having 1976 total family income of $3,000 or less). For details on the 1976 income figures, see S. Loux and R. Sadacca, "Estimates of Rent and Tenant Income Levels in Public Housing Under Various Definitions," (Washington, D.C.: Urban Institute Working Paper 247-1, 1977).

[6] It has often been argued that the cost of public housing is higher than necessary due to the distortions in building techniques which subsidizing capital costs encourage. R. F. Muth in his Public Housing: An Economic Evaluation (Washington, D.C.: The American Enterprise Institute, 1973) estimates public housing to be about 120 percent as expensive as it would be under a factor-neutral subsidy. On the other hand, the U.S. General Accounting Office has recently concluded the opposite in a long-term cost comparison of New Section 8 units and public housing; see "A Comparative Analysis of Subsidized Housing Costs," (Washington, D.C.: Program Analysis Division, General Accounting Office, 1976).

Finally, we might also note that there has been considerable discussion of the value of increasing housing consumption to such a degree through public housing. Several estimates have been made of the relation between subsidy cost for public housing and the value which public housing tenants place on the additional housing they receive. They show that tenants could be made

modest market effects because the households being removed from competition for privately owned dwellings are living in some of the least desired units. Making these units available to other households will likely not have much influence on their housing choices.

Many of the included programs were designed to have approximately the same cost nationally. The only programs not included in this group are the major income maintenance program and the Section 8 Housing Assistance Plan. Note, however, that there can be considerable variation in local (SMSA) cost of programs having the same aggregate national costs. Keeping the national costs roughly constant also required some juggling of the exact terms of the subsidy. For example, for the combined housing allowance-new construction program to cost about the same as the exclusive housing allowance program resulted in a less generous allowance program with fewer participants and a shallower capital cost subsidy for new units. The most expensive program by far is large scale income maintenance. The Section 8 program included in this comparison has a national cost substantially less than the other programs.

Finally, note that all of the simulations reported in this chapter are for the 1960-70 period. Each represents a program being in operation over the decade of the 1960s (beyond those which actually were in operation), and shows how the program's presence would have altered the housing situation in a

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[6](continued) equally well-off with a smaller cash subsidy than that embodied in the housing subsidy they receive; in other words, they value the housing subsidy at less than its resource cost. Two studies drawing this conclusion are: D. M. Barton and E. O. Olsen, "The Benefits and Costs of Public Housing in New York City," (Madison: Institute for Research on Poverty, Paper 372-76) and J. E. Adams," The Performance of Public Housing in Small Cities: Net Tenant Benefits and Federal Expenditures," Nebraska Journal of Economics and Business, Vol. 15, No. 3, pp. 59-71. Both of these analyses use the method developed by Joseph de Salvo in his, "A Methodology for Evaluating Housing Programs," Journal of Regional Science, Vol. 11, 1971, pp. 173-86.

particular type of metropolitan area in 1970.

Comparing the Programs

A qualitative comparison of the ten programs in each of two markets is presented in Table 6.2. A glance at the left-hand stub shows that the focus is on the program effects on the lower-income households and on the amount of housing which is withdrawn from the stock due to the program.[7] Two groups of lower-income households are included. The first consists of program participants under entitlement programs like housing allowances and Section 8. The second group, termed the "target population", includes roughly all households in the lowest income quartile. The entries for this group show the combined direct and indirect effects of the program for lower income households; they are important because some programs can provide major housing improvements to a few poor households but only at the expense of worsening the situation of others.

Two sets of cost figures are displayed. The first is the average monthly subsidy payments to participating households under entitlement programs. This is indicative of full costs only for pure entitlement programs. For programs using a mix of consumer and supplier subsidies or supplier subsidies exclusively, the figures in Section D of the table on total program costs relative to the cost of a housing allowance provide more comprehensive information.

There are five levels for the qualitative entries in the table, ranging from very high to very low. The table is organized so that, except for the two cost entries, a higher rating connotes the program being "better." The extreme ratings--very high and very low--are used only in those few instances

[7] The number of additional model dwellings withdrawn is the same as the number of additional new units whose construction is induced by the program.

Table 6.2 Comparison of Effects of Alternative Policies Under Sharply Different Market Conditions[a]

City and Indicator		Income Maintenance		New Construction Subsidies				Rehabilitation subsidy combined with housing allowance		
	Housing allowance	Small	Large	Across the Board	1-step combined with housing allowance	1-step	2-step		Section 8	Public Housing
CLOTH										
High Minority-Rapid Growth										
A. Impact on Participants[d]										
Average monthly subsidy	moderate	moderate	high	b	low	b	b	low	moderate	very high
Participation rate	high	high	high	b	high	b	b	high	high	high
Earmarking ratio[e]	moderate	moderate	low	b	moderate	b	b	moderate	high	c
Improvement in housing consumption	moderate	low	moderate	b	high	b	b	high	high	very high
Control of price of housing services	high	high	high	b	high	b	b	high	high	c
B. Impact on Target Population[f]										
Improvement in housing consumption	high	moderate	high	moderate	high	moderate	low	high	moderate	high
Control of price of housing services	high	high	high	high	high	high	high	high	high	c
C. Preservation of base year housing stock[g]	moderate	high	moderate	low	moderate	low	low	high	moderate	moderate
D. Total program cost relative to cost of housing allowance[h]	--	moderate	very high	low	moderate	moderate	moderate	moderate	low	moderate
GRAIN										
High Minority-Slow Growth										
A. Impact on Participants[d]										
Average subsidy	low	low	high	b	low	b	b	low	low	very high
Participation rate	high	high	high	b	high	b	b	moderate	high	high
Earmarking ratio[e]	high	low	very low	b	low	b	b	high	high	c
Improvement in housing consumption	moderate	low	moderate	b	moderate	b	b	high	high	very high
Control of price of housing services	low	moderate	low	b	low	b	b	low	moderate	c
B. Impact on Target Population[f]										
Improvement in housing consumption	moderate	low	moderate	low	moderate	low	low	high	high	high
Control of price of housing services	low	moderate	low	very high	moderate	very high	very high	high	high	high
C. Preservation of base year housing stock[g]	high	high	high	moderate	high	high	moderate	moderate	moderate	moderate
D. Total program cost relative to cost of housing allowance[h]	--	high	very high	high	high	high	high	moderate	low	high

[a] Full description of programs simulated is provided in Table 6.1. The simulations for Cloth were done assuming producers of housing from the existing stock to be comparatively responsive to changes in demand; those in Steel, under the opposite assumption. All results are for the 1960-70 period.

[b] Participants not explicitly defined for this program.

[c] Participants housing expenditures generally decline under public housing. The earmarking ratio is not defined because the household is simply given a unit of a certain quantity of services; all of the subsidy produces more services. Because of the way in which public housing is valued, it is not possible to define a price per unit of housing services for public housing occupants.

[d] Households participating in the program.

[e] The ratio of the change in housing expenditures to subsidy received.

[f] Defined as the group eligible for participation under a national housing allowance program, with 22 percent of households eligible.

[g] Equivalent to the number of new units whose construction was induced by the program.

[h] This is cost for program in this type of housing market, not the cost of a national program. A "moderate" classification means the program costs about the same as the housing allowance program.

where the effect of a program was extremely different from any other program. The overall qualitative classification of effects is based on the comparison of the particular effect (e.g., improvement in housing) of a given program to (a) the impact of other programs in that market in improving housing, and (b) our general experience based on a wide range of simulated programs in widely diverse markets. Examples of the latter are our general knowledge of participation rates and earmarking ratios[8] in entitlement programs. There is obviously a good deal of judgment involved in the classifications, and the reader can examine the numbers on which the classifications are based (Appendix F) if he chooses.

It is extremely difficult to succinctly summarize what the mass of information in the table tells us about which programs should be preferred in each market. At the risk of oversimplification, one can begin by looking at which programs get "high" ratings on improving the housing situation of the target population--for both increasing the quantity of services (consumption) and controlling prices. There are four programs which have this characteristic for the rapidly growing-high minority city: housing allowance, major income maintenance, housing allowance combined with a new construction subsidy, and a housing allowance combined with a rehabilitation subsidy. A fifth--the less costly Section 8 program--nearly qualifies; and a bigger Section 8 program (that referred to as the Fair Share Allocation in Chapter 3) certainly would. By contrast, only two programs help the target population as much in the slow growth-low minority city: Section 8 and the combined housing allowance rehabilitation subsidy.[9]

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[8] Defined as the ratio of increased housing expenditures to subsidy payments.

[9] Public housing has not been included in these lists as the effects on consumption are virtually totally concentrated on the two model households moved into public housing units under the program. These increases are very large, large enough to substantially raise the average housing level of the target population; but we view this average change to be misleading in terms of the actual situation of the target population.

Two points stand out from these lists. One is that those programs involving actions which both increase the demand for housing services and augment the supply of dwellings where the increased demand is concentrated tend to be more successful. These are the housing allowance-supply subsidy combinations and the Section 8 housing assistance program. It is important in this regard to note the advantages of administrative simplicity and built-in coordination of Section 8 compared to mixes of separate programs.

The second point obvious from the lists is that more programs work under high growth-high minority situations than in the opposite case. In particular, the solely demand augmenting programs do well under these conditions but not in the opposite situation. The explanation for this difference has been noted earlier, but repetition at this juncture may be useful. Cities with rapidly growing moderate-to-low-income populations put on a good deal of demand pressure on housing in the lower quality portion of the market, and this keeps the price per unit of service for low quality units close to the price per unit of service in the rest of the market. As a consequence, introduction of housing demand augmenting programs only can increase the price of lower quality housing modestly before it becomes competitive with the price per unit of service of newly built housing of the same "size." Demand pressure causes construction of new housing, often for households with incomes only slightly above those of program participants. It is this modest rise in price which allows the bulk of increased housing expenditures to result in improved housing quality.

Cities with slowly growing moderate-to low-income populations, on the other hand, often have a surplus of housing in the lower quality range, since higher income households will demand some new housing in response to income growth and depreciation of the existing stock. For this reason the price per unit of

service of lower quality housing is beneath that of housing in the rest of the market. The introduction of a demand stimulating program puts price pressure on dwellings in the critical range. In some ways the increase in prices is desirable: without it landlords could not afford to improve their dwellings to meet program standards or the increased wants of participating households. Note, though, that even with the increase, the price per unit of service of these dwellings is low enough not to be in competition with newly built units. While these price rises keep older housing in the active stock, they also choke off some of the increased demand and causes the increase in expenditures by participants to be heavily weighted by price increases.

The problems of achieving multiple-objectives with individual housing programs is well illustrated by the effects which the programs getting high marks on improving the housing situation of the target population have on preserving the stock. There is only one program in both cities combined which scores "high" on preserving the stock while achieving this other objective.[10] All of the rest, however, score "moderate" on this criteria. If the preservation objective were to be strongly emphasized, there are two programs (besides the one noted above) which get "high" marks on preservation and "moderate" marks on improving the housing of the target population: in Cloth (rapid growth) it is the small income maintenance program, and in Grain (slow growth) it is the combined housing allowance and new construction subsidy. Of course, the weight one attaches to the preservation objective in practice would depend on the serviceable life of the lower quality dwellings and the characteristics of the neighborhoods where they are located, factors which will vary sharply among metropolitan areas.

Another way of evaluating the effectiveness of those programs which did not rate "high" in their effects on the housing of the target population is to ask how far below the "high" programs they actually are. In Cloth (rapidly

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[10]This is the combined rehabilitation and housing allowance program in the rapidly growing city.

growing) use of most of these less effective programs--in particular, the small income maintenance program, the across-the-board capital subsidy of new dwellings, and the one-step capital subsidy for new units--would not be too costly. All of these rate highly in controlling the increases in the price per unit of housing service faced by the target population. They also rate "moderate" scores for increasing housing consumption; in practice, the "high" scores mean a 24-30 percent increase in the quantity of housing services consumed, while a "moderate" score means a 16-20 percent increase. On the other hand, a 2-step capital subsidy produces only a 10 percent rise in the quantity of housing services consumed by the target population.[11]

In Grain (slow growing) one could do much worse in selecting the wrong type of program. All of the programs designed to increase consumption by augmenting demand--housing allowances or the income maintenance programs--rate a "low" evaluation for either controlling prices or improving housing quality. Further, all of the programs relying exclusively on capital subsidies for new dwellings score "low" in increasing housing quality, i.e., the improvement never exceeds 5 percent. Put simply, these programs would be singularly inefficient in achieving their goals. The new construction subsidies, for example, would basically

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[11]The new construction subsidies can work to actually reduce consumption of the target population if these households are spending more on housing before the introduction of the program than they desire. The rate at which the substitution occurs depends, in part, on how great this difference is, and, in part, on how great this difference is, and, in part, on how responsive housing consumption in general is to price changes. Under the 2-step construction subsidy the price reductions are particularly sharp so that households are able to achieve the housing consumption level they want with no increase in expenditures and generally a decrease.

provide subsidies to new building (for moderate income households) which would have occurred anyway; and any additional building would only serve to lower further the price for unit of housing services in the lower quality portion of the market and cause even deeper reductions in dwelling maintenance.

We draw three broad conclusions from the comparisons presented in this and earlier chapters. First, the conditions present in the individual metropolitan housing markets do indeed have a strong impact on the effectiveness of housing programs in improving the housing situation of lower income households and in preserving the housing stock.

Second, use of a mix of demand stimulating actions in the form of restricted or unrestricted cash transfers and actions directly or indirectly making more dwellings of suitable quality available to lower income households will generally be more effective than exclusive reliance on either demand or supply augmenting programs. This implies considerable merit in the Section 8 Housing Assistance Program. In the event that a major welfare reform were enacted which increased housing demand, then a strong case can be made for complementary modest subsidies to suppliers to relieve market pressures. In the slower-growing markets especially, this would increase the effectiveness of welfare reform in improving the housing of lower income households.

Third, the best program appears to be one which would allow the mix between programs augmenting the supply of dwellings in the critical quality range and those fueling housing demand to vary locally. The argument for local determination certainly has merit, given the predominance of knowledge of immediate problems in the housing markets at that level. On this ground, the Section 8 Program with its locally prepared Housing Assistance Plans appears to be highly desirable. At the same time it would be unrealistic to believe that local planning

officials will have the resources to evaluate the long-term consequences of the strategies they put forward or to make reasonably accurate projections of the shifts in the growth, income and age distributions of households in their area. These limitations argue persuasively for locally-determined housing strategies only within a framework of guidance on the trends in basic economic and demographic forces in their area and on the likely long-term direct and indirect effects of alternative strategies in metropolitan areas like theirs.

Appendix A

An Overview Description of the Model

Households

Each model household represents several hundred or thousand actual households at the end of a decade. The exact number depends on the end-of-decade size of the metropolitan area to which the model is being applied, and the restriction that the model can efficiently handle a maximum of 40-45 households. A model household belongs to one of several household types. The types that have been used in applying the model to specific metropolitan areas include (1) white nonelderly families, (2) white elderly and/or single person households, (3) black nonelderly families, and (4) black elderly and/or single person households.[1]

Model households are further characterized by two income measures. One is an actual income figure, the actual mean end-of-period income of the households it represents as reported in the U.S. Census; this figure is used to calculate the household's eligibility for certain government programs, the size of subsidy it might receive, or income tax it might be required to pay. The second measure is a form of permanent or normal household income, the

[1] In the application to Austin two additional household types were defined for Chicano households.

measure relevant to the household's housing consumption decision.[2]

The behavior of households in the model consists of deciding which of all possible dwellings to occupy. "All possible dwellings" includes a new dwelling of any desired level of services (subject to any government-imposed minimum standards for new construction) as well as any of the existing dwellings in the model. The household makes its decision on the basis of the quantity of housing services which each dwelling offers, the price per unit of housing service at which those services are offered, the household's income, and three characteristics of the zone in which each dwelling is located.

The three zone characteristics to which households pay attention are (a) average travel time to and from work, (b) average net rent per dwelling, and (c) the proportion of zone residents which belong to the same racial group as the household making the choice. The first of these, travel time, is simply fed into the model as a piece of exogenous information about a zone. The other two, average net rent and racial composition, are determined by the model itself, so that there is a two-way interaction between household choice and these zone characteristics. All of the variables influencing household choices are combined into a utility function (i.e. a function which quantifies the amount of enjoyment the household receives from each of these factors) which the household is attempting to maximize.

Dwellings

Each model dwelling, like each model household, represents several hundred or thousand actual cases--in fact, the number of actual cases per

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[2]Actually the measure used in the model is smoothed more than necessary for the permanent income concept. This further smoothing is needed because of the unity income elasticity of demand for housing implied by the particular form of the utility function used in the model. For details see deLeeuw-Struyk, op.cit.

model unit is the same for dwellings as it is for households. Each model dwelling belongs to one of several zones (5 or 6 zones in work so far) that differ in accessibility, initial wealth, and/or initial racial composition.

Each model dwelling is also characterized by the quantity of housing services which it supplies at the beginning of the ten-year interval being examined. The level of housing services of a dwelling, one of the basic concepts of the model, refers to an index of all the things of value which a physical structure provides--space, shelter, privacy, design, and a host of others. It does not refer to the neighborhood characteristics associated with each dwelling; these are measured by the various attributes of the zone in which a dwelling is located.

The behavior of the owners of existing dwellings is to make price-quantity offers with the goal of maximizing expected profits. Each price-quantity offer consists of a quantity of housing services to be provided at the end of the decade to which the model refers and a price at which that quantity will be provided. The offers thus resemble rental advertisements appearing in newspapers. The price-quantity offers for each dwelling must lie along a supply schedule (i.e., a schedule of these price-quantity offers consistent with the housing-services production technology and landlord expectations). The position of the schedule depends on (a) the initial quantity of housing services offered by the dwelling and (b) two parameters of the model, one representing the depreciation rate and the other related to the responsiveness of supply to a change in price.

The owner of each existing dwelling seeks to locate as high up along his supply curve as he can--that is, to charge as high a price as possible without causing his dwelling to be vacant. His expected profits are an increasing

function of this position along the supply curve. Competition among the owners of actual dwellings comprising each model dwelling is assumed sufficient to keep landlords from finding takers for offers above their supply curves and hence realizing excessive profits. Note that the model does not separate owner-occupants from renters; owner-occupants are in effect viewed as landlords renting to themselves.

The model includes a minimum price per unit of service, defined as that price which is just sufficient to cover the cost per unit of service of maintaining a dwelling in operation. If the owner of a dwelling is unable to find an occupant at any price at or above the minimum then his dwelling is withdrawn from the stock of housing. Withdrawal in actual housing markets can take the form of long-term vacancy, demolition, conversion to nonresidential use, or abandonment. The model does not distinguish among these different ways of withdrawing a unit from the stock.

Builders

The third actor in the model, the building industry, plays a more passive role than model households and model dwellings. The building industry is characterized by being prepared to offer new dwellings at a fixed price per unit of service, so that the monthly total cost of a dwelling is proportional to the level of services it provides. This treatment of the supply of new housing as being extremely responsive to demand over a 10-year period is consistent with the available econometric evidence. The price per unit of service at which new dwellings are available is taken as given for each housing market. Empirically, it is measured on the basis of FHA data on the cost per square foot of new dwellings.

This exogenous price per unit of housing service tends to set a ceiling for the price structure of the existing stock, although existing dwellings with especially favorable zone characteristics can command prices moderately (usually 10-15 percent) above the new construction price. Newly constructed

dwellings are assumed to be exclusively concentrated in a single "zone of new construction", which corresponds roughly to the suburbanization of new construction.

Governments

The final actor of the model, government, can influence the housing location process at so many different points that it is impossible to describe its behavior succinctly. Tax charges, subsidy payments, transfer payments with or without earmarking for housing, minimum new construction requirements, and minimum quantities of housing services in a particular zone are among the ways in which government can affect housing markets in the model.

An income tax can be represented by replacing a household's actual income by income less the tax before it enters the housing market. Tax rates and other aspects of tax formulas--for example, exemption levels--can be set separately for each household type, or even for each model household. Transfer payments are represented using the same procedure as for taxes. A transfer earmarked for housing--a housing allowance--can be represented by requiring an eligible household to consume at least some minimum level of housing services or spend some minimum amount on housing in order to receive the transfer; the household then determines its utility-maximizing choice without the allowance, its choice with the allowance (including the minimum requirements), and selects the behavior which yields higher utility. A restrictive zoning ordinance can be represented by setting a minimum level of housing services for all of the dwellings in a zone. In brief, the model is exceptionally rich in the variety of government policies it can handle.

The Solution Process

A solution of the model, as mentioned earlier, is a situation in which none of the four actors has any incentive to change his position. Each household is the unique occupant of one dwelling, the one which maximizes its satisfaction given all the price-quantity offers facing it. The owner of each existing dwelling is charging the highest price he can (i.e., is as high up along his supply curve as possible) without finding his dwelling vacant (if a dwelling is vacant even at the lowest point on its supply schedule, it is withdrawn from the stock). The building industry is supplying the number of new dwellings which households are willing to purchase. Government regulations are strictly enforced.

The computer program to solve the model searches for a solution with these properties through a process of trial and error. Departures from solution conditions in one trial govern the way in which the solution is modified for the next trial. The steps in the search process have no theoretical or empirical significance; a housing market may search for a solution in a different way than the computer program. It is only the final solution of a problem which is of interest. Once the program finds a solution, the results can be tabulated in a variety of ways depending on their use: prices, quantities, and locations can be shown by household, by dwelling, by zone, by household type, or, in the case of certain subsidy programs, by household eligibility and participation status.

Appendix B

Classification of U.S. SMSAs Into Four Prototypical City Types

High Minority-Rapid Growth

Albany, Ga.

Atlanta, Ga.

Augusta, Ga.-S.C.

Baton Rouge, La.

Biloxi-Gulfport, Miss.

Birmingham, Ala.

Bryan-College Station, Tx.

Charleston, S.C.

Charlotte, N.C.

Chattanooga, Tenn.

Columbia, S.C.

Columbus, Ga.-Ala.

Columbus, Ohio

Dallas, Tx.

Durham, N.C.

Fayetteville, N.C.

Fort Lauderdale-Hollywood, Fla.

Gainesville, Fla.

Galveston-Texas City, Tx.

Greenville, S.C.

Houston, Tx.

Huntsville, Ala.

Jackson, Miss.

Jacksonville, Fla.

Kansas City, Mo.-Kans.

Lafayette, La.

Lawton, Okla.

Lexington, Ky.

Little Rock-N. Little Rock, Ark.

Los Angeles-Long Beach, Calif.

Macon, Ga.

Memphia, Tenn.-Ark.

Miami, Fla.

Mobile, Ala.

Monroe, La.

Nashville-Davidson, Tenn.

New Orleans, La.

Norfolk-Portsmouth, Va.

Orlando, Fla.

Pensacola, Fla.

Petersburg-Colonial Heights, Va.

Raleigh, N.C.

Richmond, Va.

San Francisco-Oakland, Calif.

Shreveport, La.

Tallahassee, Fla.

Tuscaloosa, Ala.

Tyler, Tx.

Washington, D.C.-Md.-Va.

West Palm Beach, Fla.

Wilmington, Del.-N.J.-Md.

Wilmington, N.C.

Low Minority-Slow Growth

Abilene, Tx.
Akron, Ohio
Albany-Schenectady-Troy, N.Y.
Allentown-Bethlehem-Easton, Pa.-N.J.
Altoona, Pa.
Anderson, Ind.
Appleton-Oshkosh, Wisc.
Bay City, Mich.
Binghamton, N.Y.
Boston, Mass.
Bridgeport, Conn.
Bristol, Conn.
Brockton, Mass.
Buffalo, N.Y.
Canton, Ohio
Cedar Rapids, Iowa
Charleston, W.Va.
Cincinnati, Ohio-Ky.-Ind.
Cleveland, Ohio
Danbury, Conn.
Davenport-Rock Island-Moline, Iowa.-Ill.
Dayton, Ohio
Decatur, Ill.
Des Moines, Iowa
Dubuque, Iowa
Erie, Pa.
Evansville, Ind.-Ky.
Fall River, Mass.-R.I.
Fargo-Morehead, N.Dak.-Minn.
Fitchburg-Leominister, Mass.
Fort Wayne, Ind.
Grand Rapids, Mich.
Green Bay, Wisc.
Harrisburg, Pa.
Hartford, Conn.
Jackson, Mich.
Jersey City, N.J.
Johnston, Pa.
Kalamazoo, Mich.
LaCrosse, Wisc.
Lancaster, Pa.
Lansing, Mich.
Lawrence-Haverhill, Mass.-N.H.
Lewiston-Auburn, Maine
Lima, Ohio
Lincoln, Neb.
Lorain-Elyria, Ohio
Lowell, Mass.
Manchester, N.H.
Meriden, Conn.
Milwaukee, Wisc.
Minneapolis-St. Paul, Minn.

Low Minority-Slow Growth (continued)

Muskegon-Muskegon Heights, Mich.
Nashua, N.H.
New Bedford, Mass.
New Britain, Conn.
Norwalk, Conn.
Paterson-Clifton-Passaic, N.H.
Peoria, Ill.
Pittsburgh, Pa.
Pittsfield, Mass.
Portland, Maine
Racine, Wisc.
Reading, Pa.
Rochester, Minn.
Rochester, N.Y.
St. Joseph, Mo.
Scranton, Pa.
Sherman-Denison, Tx.
Sioux City, Iowa-Nebr.
Sioux Falls, South Dakota
South Bend, Ind.
Spokane, Wash.
Springfield, Ill.
Springfield, Mo.
Springfield, Ohio
Springfield-Chicopee-Holyoke, Mass.-Conn.
Stamford, Conn.
Steubenville-Weirton, Ohio-W.Va.
Syracuse, N.Y.
Texarkana, Tx.-Ark.
Toledo, Ohio-Mich.
Topeka, Kansas
Utica-Rome, N.Y.
Waterloo, Iowa
Wheeling, W.Va.-Ohio
Wichita, Kansas
Wichita Falls, Tx.
Wilkes-Barre-Hazleton, Pa.
Worcester, Mass.
York, Pa.
Youngstown-Warren, Ohio

High Minority-Slow Growth

Atlantic City, N.J.

Baltimore, Md.

Beaumont-Port Arthur-Orange, Tex.

Chicago, Ill.

Detroit, Mich.

Flint, Mich.

Gadsen, Ala.

Gary-Hammond-E. Chicago, Ill.

Greensboro, N.C.

Indianapolis, Ind.

Lake Charles, La.

Louisville, Ky.-Ind.

Lynchburg, Va.

Montgomery, Ala.

New Haven, Conn.

New York, N.Y.

Newark, N.J.

Newport News-Hampton, Va.

Philadelphia, Pa.

Saginaw, Mich.

St. Louis, Mo.

Savannah, Ga.

Trenton, N.J.

Waco, Tex.

Low Minority-Rapid Growth

Albuquerque, N.M.

Amarillo, Tx.

Anaheim-Santa Ana-Garden Grove, Calif.

Ann Arbor, Mich.

Asheville, N.C.

Austin, Tx.

Bakersfield, Calif.

Billings, Mont.

Bloomington-Normal, Ill.

Boise City, Idaho

Brownsville, Harlingen, San Benito, Tx.

Champaign-Urbana, Ill.

Colorado Springs, Col.

Columbia, Mo.

Corpus Christi, Tx.

Denver, Col.

Duluth-Superior, Minn.-Wisc.

El Paso, Tx.

Eugene, Ore.

Fort Smith, Ark.-Okla.

Fort Worth, Tx.

Fresno, Calif.

Great Falls, Mont.

Hamilton-Middleton, Ohio

Honolulu, Hawaii

Huntington-Ashland, W.Va.-Ky.-Ohio

Kenosha, Wisc.

Knoxville, Tenn.

Lafayette, W. Lafayette, Ind.

Laredo, Tx.

Las Vegas, Nev.

Lubbock, Tx.

Madison, Wisc.

Mansfield, Ohio

McAllen-Pharr-Edinburg, Tx.

Midland, Tx.

Modesto, Calif.

Muncie, Nev.

New London-Groton-Norwich, Conn.

Odessa, Tx.

Ogden, Utah

Oklahoma City, Okla.

Omaha, Neb.-Iowa

Owensboro, Ky.

Oxnard-Ventura, Calif.

Phoenix, Ariz.

Pine Bluff, Ark.

Portland, Oreg.-Wash.

Providence-Pawtucket-Warwick, R.I.-Mass.

Provo-Orem, Utah

Pueblo, Col.

Reno, Nev.

Low Minority-Rapid Growth (continued)

Roanoke, Va.

Rockford, Ill.

Sacramento, Calif.

Salem, Oreg.

Salinas-Monterey, Calif.

Salt Lake City, Utah

San Angelo, Tx.

San Antonio, Tx.

San Bernardino, Riverside, Ontario, Calif.

San Diego, Calif.

San Jose, Calif.

Santa Barbara, Calif.

Santa Rosa, Calif.

Seattle-Everett, Wash.

Stockton, Calif.

Tacoma, Wash.

Tampa-St. Petersburg, Fla.

Terre Haute, Ind.

Tucson, Ariz.

Tulsa, Okla.

Vallejo-Napa, Calif.

Vineland-Milleville, Bridgeton, N.J.

Waterbury, Conn.

APPENDIX C

Projections of Key Model Inputs Used in Chapter 5

A. The Household Income Distribution

We were fortunate to have DYNASIM available to us for making the projections of household income. DYNASIM is designed to depict particular elements of the status of persons and families and their economic and demographic behavioral characteristics. Using macro-economic forecasts as inputs DYNASIM can in effect "grow" families forward into the future, tracing demographic and economic changes which households will undergo by applying previously estimated behavioral relationships to each household on a probabilistic basis.[1] The projections of household incomes as of 1980 were a by-product of an analysis of future AFDC case loads; only minor additional tabulations with the file of 1980 households were needed to obtain income distributions for each of the four household types used in the model.[2]

The top part of Table C-1 shows the level and percentage change in the mean real and money incomes of households over the decade of the sixties calculated using decennial Census and Current Population Survey (CPS) data and

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[1]A general description of this model is in H. Guthrie, "Microanalysis Simulation Modeling for Evaluation of Public Policy," Urban Affairs Quarterly June 1972, pp. 403-17. A full description is in Guy Orcutt, S. Caldwell, R. Wertheimer, et al., Policy Exploration Through Microanalytic Simulation (Washington, D.C.: The Urban Institute, 1976).

[2]For details see R. F. Wertheimer II and S. R. Zedlewski, "The Impact of Demographic Change on the Distribution of Earned Income and the AFDC Program: 1975-1985", (Washington, D.C.: Urban Institute Working Paper 985-1, 1976).

Table C-1

Summary of Calculated Change in Average Household Income 1960-70 and 1970-80

Micro Household Data Income Levels	current dollars	1967 dollars[i]
1959 Census[a]	6,200	6,989
1969		
CPS[b]	9,759	8,391
Census[c]	10,136	8,751
1979 - DYNASIM	21,260	10,721
Percentage Change		
1959-69[d]		
CPS	57.4	20.0
Census	63.4	24.6
1969-79[e]		
CPS	117.8	27.7
Census	109.7	22.5
National Accounts Personal Income and Aggregate Household Counts Data[f]		
Income Levels		
1960-GNP data[g]	7,446	8,394
1970-GNP data[g]	12,354	10,622
1980-DRI estimate[h]	24,645	12,432
Percentage Change		
1960-70	65.9	26.5
1970-80	99.5	17.0

(Notes on following page)

[a]Table A-3, U.S. Bureau of the Census, U.S. Census of Housing: 1960, Vol. II Metropolitan Housing, Part 1, (Washington, D.C.: U.S. Government Printing Office, 1963).

[b]Tables 24 and 32, U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 101, "Money Income in 1974 of Families and Persons in the United States," (Washington, D.C.: U.S. Government Printing Office, 1976).

[c]Table A-3, U.S. Bureau of the Census, U.S. Census of Housing: 1970, Metropolitan Housing Characteristics, HC(2)-1, (Washington, D.C.: U.S. Government Printing Office, 1973).

[d]1959 Census data used in both computations.

[e]1979 DYNASIM data used in both computations.

[f]Number of households for 1960 and 1970 from decennial Census Reports cited in notes a and c; for 1980 from U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 607. "Projections of the Number of Households and Families: 1975 to 1990," (Washington, D.C.: U.S. Government Printing Office, 1975).

[g]Table B-15, Economic Report of the President (Washington, D.C.: U.S. Governement Printing Office, 1976).

[h]Data Resources, Inc.; forecast of May 1976.

[i]Deflated using Consumer Price Index.

the level and percentage change over the seventies from the DYNASIM forecast deflated to 1979.[3] Rather surprisingly these data show the real income growth in the present decade to be roughly the same as that during the 1960s. This is surprising in light of the lack of virtually any growth in real income between 1969 and 1974, as shown in Table C-2. Further, the 1970-74 period appears to have been less favorable for real income growth than the 1960-64 period, as suggested by the plot of median incomes since 1951 in Figure C-1; and there is little expectation for the income growth over 1975-79 period to approach that which occurred in the last half of the 1960s.

To check the plausibility of the DYNASIM forecast, we computed the growth in average household income for the 1960-70 and 1970-80 periods using personal income data from the national income accounts and figures on the total number of households from the decennial Census and Census projections.[4] The results of these calculations, shown in the lower part of Table C-1, are more consistent with expectations, showing a 17 percent growth in real income during the 1970s compared to a 26.5 percent rise over the sixties. The macro forecast used by DYNASIM and that employed in the computations just described are essentially identical, so the difference in income growth rates lay elsewhere. Three features of the DYNASIM calculations might account for the discrepancy: a) it uses somewhat different definitions of families and primary individuals; b) DYNASIM necessarily makes assumptions about the participation and benefit levels of a host of welfare and income transfer programs which might turn out to be too high; and c) the model uses fairly short-term experience on wealth accumulation

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[3]The deflation was by the change in the Consumer Price Index plus a further 2 percent adjustment for increased real income, roughly equivalent to the projected rise in productivity in 1980.

[4]Use of the decennial Census household data dictated using the years 1960 and 1970 instead of 1959 and 1969. From Figure C-1 it is fairly clear that this change should have very modest effects on the 10-year percentage change calculations.

Table C-2

Percentage Change in Income 1969-1974
by Household Type[a]

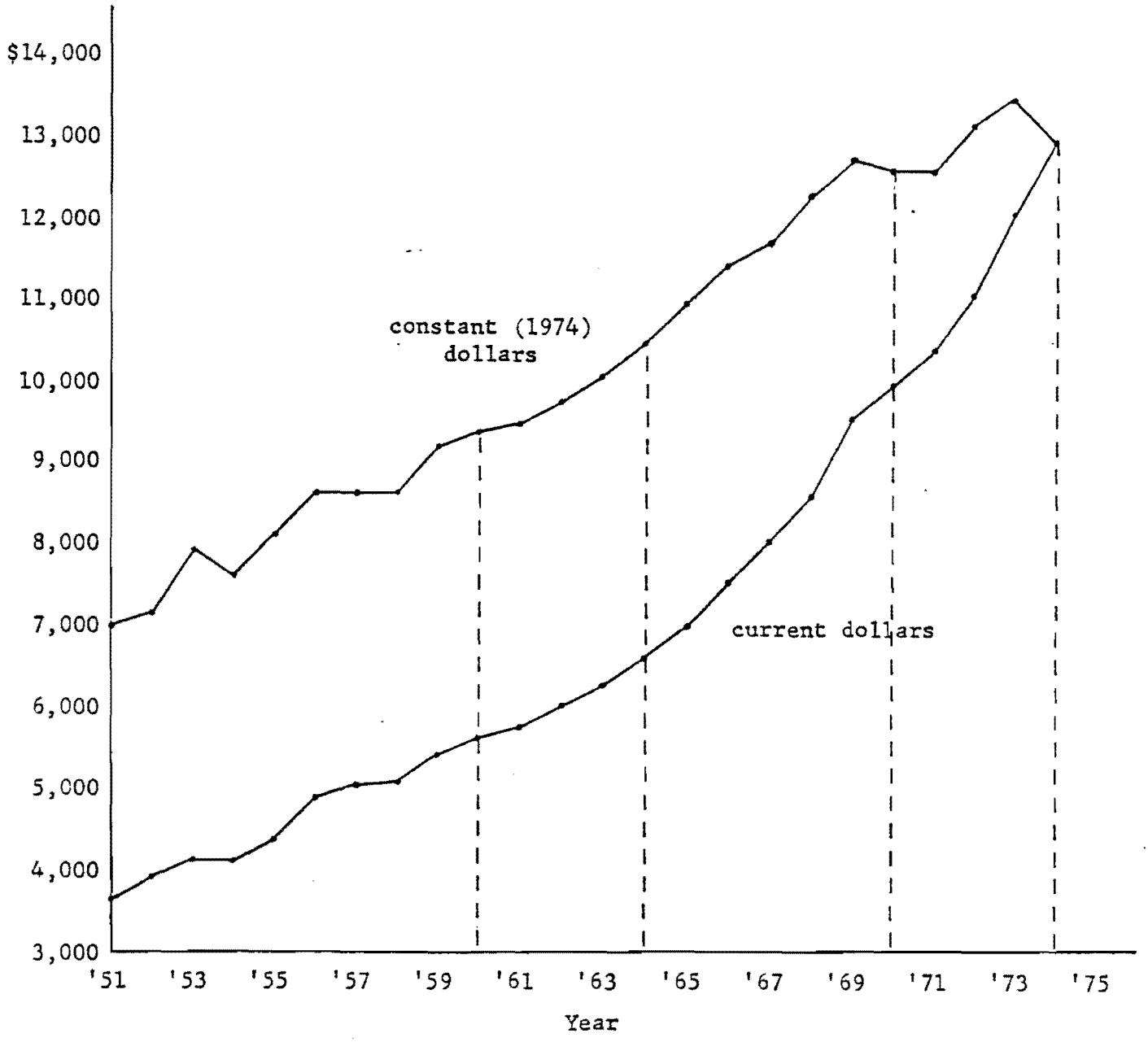
	number of household (000's)		mean income				percentage change 1969-74	
			money		real[b]		money	real
	1969	1974	1969	1974	1969	1974	income	income
Whites								
Families								
Total	46022	49451	10953	15047	10021	9334	37.3	-6.8
Over 65	6515	7319	6927	9998	6338	6202	44.3	-2.1
Under 65	39507	42312	11616	15924	10628	9878	37.0	-7.0
Primary Individuals								
Total	10319	13611	4562	6436	4174	3992	41.0	-4.3
Elderly Families plus Primary Individuals	16834	20930	5477	7681	5011	4764	40.2	-4.9
Blacks								
Families								
Total	4774	5498	6971	9515	6378	5902	36.4	-7.4
Over 65	507	641	4205	6601	3846	4095	56.9	6.4
Under 65	4267	4857	7300	9899	6679	6141	35.6	-8.0
Primary Individuals								
Total	1309	1793	3044	4628	2785	2871	52.0	3.0
Elderly Families plus Primary Individuals	1816	2434	3368	5148	3081	3193	52.8	3.6

[a]Source: U.S. Bureau of the Census, Current Population Reports, Series P.60, Nos. 75 and 101, "Income in 1969 of Families and Persons in the United States," and, "Money Income in 1974 of Families and Persons in the United States," (Washington, D.C.: U.S. Government Printing Office, 1970 and 1976).

[b]Deflated with the Consumer Price Index, 1967=100.

Figure C-1

Median Incomes of Families, 1951-1974



as the basis for the wealth predictions to 1980.[5] We do not have the requisite information or resources to determine the actual cause of the difference, so we have adopted the procedure of using the average real income increase indicated by the personal income data and the DYNASIM income distribution appropriately deflated to be consistent with the average growth rate.

Actually, two distinct distributions were needed for the analysis of the effects of shifts in household income. Recall that one part of the analysis involves holding constant all other conditions in a housing market over the 1960-70 period while replacing the 1970 household incomes with their 1980 counterparts. In this part of the analysis, the 1970 distribution was retained, and the income of each model household has been adjusted for the difference in average real income growth of all households between the two decades. The second part of the analysis is a full projection of the housing market in a specific "city" as of 1980. In this analysis the 1980 DYNASIM income distribution for each of the four household types is used to generate model incomes for the forecasted number of 1980 households of each household type, and then each model household's income is reduced to hold the average growth in real income to 17 percent.[6] Table C-3 lists the 1970 and 1980 model households used in these analyses.

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[5]To examine the effect of these assumptions we contrasted the 1974 income distributions predicted by DYNASIM, which began with a 1970 population, and that reported in the Current Population Reports. This comparison was limited by the large size of some of the income intervals required for interval matching, but the general picture which emerged was one of general comparability. It is possible that the 1980 projections are more heavily influenced by items b) and c) differing further from the assumptions of the macro-estimate.

[6]Note that percentage change in money income over the 1970s is 99 percent.

Table C-3

Annual Income of Households by City, Household Type, and Year

White nonelderly			White elderly and single		Nonwhite nonelderly		Nonwhite elderly & single
A. 1970, High minority-rapid growth							
$ 1,444	9,407	14,954	$ 1,003	6,208	$ 1,705		$ 1,963
3,212	10,061	16,637	1,812	8,168	3,912		7,131
4,784	10,747	18,607	2,701	10,907	6,115		
5,867	11,436	20,577	3,663	20,732	8,343		
6,752	12,126	22,547	4,707		11,130		
7,466	12,815	25,099			18,514		
8,113	13,505	40,037					
8,760	14,194						
B. 1980, High minority-rapid growth							
$ 2,888	19,426	35,401	$ 1,696	12,298	$ 2,600	17,336	$ 2,657
4,964	21,594	37,338	3,344	15,606	4,841	22,735	16,086
7,058	25,937	39,272	4,378	20,133	7,267	31,853	
8,978	25,724	41,208	5,658	25,620	9,583	42,591	
10,967	27,659	43,143	7,564	34,427	12,864		
13,007	29,594	45,078	9,614	43,446			
15,090	31,530	47,014					
17,256	33,466						
C. 1970, High minority-slow growth							
$ 1,629	9,783	16,741	$ 1,118		$ 1,930		$ 1,963
3,741	10,602	19,125	2,184		4,559		7,131
5,397	11,436	21,510	3,383		7,240		
6,529	12,271	23,909	4,723		10,144		
7,432	13,106	37,939	6,743		17,560		
8,215	13,904		9,518				
8,998	14,816		18,921				
D. 1980, High minority-slow growth							
$ 3,205	19,004	34,379	$ 2,010	15,013	$ 2,953		$ 2,657
5,816	21,774	36,583	3,880	20,897	5,849		16,085
8,398	24,473	39,326	5,417	29,917	8,883		
10,910	26,960	41,799	7,891	41,943	12,889		
13,519	29,433	44,272	10,908		18,837		
16,232	31,906	46,745			27,497		
					41,057		

B. The Distribution of Households by Household Types

The model generally distinguishes four household types on the basis of differences among them in housing expense-to-income ratios and income distributions; the four are 1) white, nonelderly families, 2) white, elderly families and single individuals, 3) black, nonelderly families, and 4) black, elderly families and single individuals. The projections to be made must modify the 1970 household distribution in each of the four prototypical cities. The strategy is to apply the national rate of shift among household types to the base year distribution in each of the four cities.

The Census has done projections of the distribution of households among more household types than are used in the model, but they do not make any distinction by race.[7] To effect the separation by race required a several step procedure. First, using decennial Census data for 1960 and CPS data for 1975, the distribution of households among the four household types used in the model were computed for each of the two years.[8] The average annual change in the proportion of households in each type over the 1960-75 period was assumed to hold between 1976 and 1980, and the rates of change were applied to the 1975 distribution of households by type to obtain the 1980 distribution.

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[7]U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 607, "Projections of the Number of Households and Families: 1975-1990," (Washington, D.C., U.S. Government Printing Office, 1975), Table 2, Series B.

[8]U.S. Bureau of the Census, 1960 Census of Housing, Metropolitan Housing Characteristics, HC(2)-1, United States and Regions, (Washington, D.C.: U.S. Government Printing Office, 1962). U.S. Bureau of the Census, Current Population Reports, Series P-20, No. 287, "Marital Status and Living Arrangements: March 1975," (Washington, D.C.: U.S. Government Printing Office, 1975), Table 2.

To compare these estimates with the Census projections, our projections of black and white households were combined into a single nonelderly family and a single elderly/single category using our projected proportions of the blacks and whites as of 1980 as weights. Panel B of Table C-4 shows the two sets of projections to be in close accord. The trend to 1980 in the division of black and white households between nonelderly families and elderly/singles will continue to be away from nonelderly families as it has since 1960.

The change in the mix of households by race was projected by using the 1960-1970 change in the ratio of black to total households as a base and adjusting it downward slightly for the reduced rate of black migration which has been recently documented.[9] Thus the proportion of all households which are black in our two high minority prototypical cities shifts from 14 percent in 1960 to 20 percent in 1970 to 25 percent in 1980. The 1980 model households are shown in the section describing the estimation of the 1980 income distribution.

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[9]Social and Economic Statistics Administration, U. S. Bureau of the Census, The Social and Economic Status of the Black Population in the U.S., 1971 and 1974, Series P-23, Nos. 42 and 54 (Washington, D.C.: U.S. Government Printing Office, 1972 and 1974).

Table C-4

DISTRIBUTION OF HOUSEHOLDS BY TYPE, 1960-1980

A. Distribution of Households Nationally Over Time

	blacks			whites		
	1960[a]	1970[a]	1980[b]	1960[a]	1970[a]	1980[b]
Families, head						
Under Age 65	.747	.707	.650	.746	.707	.642
Age 65 and Over	.102	.101	.082	.121	.118	.114
Primary individuals						
Under Age 65	.110	.129	.193	.075	.094	.142
Age 65 and Over	.041	.062	.074	.056	.080	.101
Total	1.00	1.00	1.00	1.00	1.00	1.00

B. Comparison of Projections for 1980

	Projection	
	racially disaggregated[b]	Census[c]
Families, head		
Under Age 65	.64	.66
Age 65 and over	.11	.11
Primary individuals		
Under Age 65	.15	.14
Age 65 and Over	.10	.09

[a]From the 1960 and 1970 Census of Housing Metropolitan Housing Characteristics, HC(2)-1, "United States and Regions," Washington, D.C., U.S. Government Printing Office, 1962 and 1972.

[b]Projection, described in text, based on separate data for black and whites.

[c]U.S. Bureau of the Census, "Projections of the Number of Households and Families: 1975 to 1990," op. cit.

C. Projecting the Growth in the Number of Households

These projections were the least complicated of those we had to make, since the Bureau of Economic Analysis (BEA) has projected the 1980 population of most of the metropolitan areas in the country.[10] Given the availability of these figures, the strategy was to compute the ratio of the percentage change in households (1960-70) to the percentage change in population for the same period based on decennial Census data and then to multiply this ratio by the 1970-80 percentage change in population calculated using the BEA data. These computations were made for each of the SMSAs on which the four hypothetical cities were based, and then the average taken for the SMSAs represented by each of the hypothetical cities. Note that the projections are for the cohorts of SMSAs with above and below median growth rates in the 1960s, not for the above and below median growth cities during the 1970s.

The numeric values for these computations are shown in items 2-6 in Table C-5 for the two hypothetical cities used in the analysis reported in the text. Over the 1970s, a 13 percent increase in the number of households in the high-growth city and a 8 percent increase in the slow-growth city is forecast (item 6). This represents a sharp decline in both cities compared to the 1960s for which their values were 27 and 13 percent, respectively.

There is, however, one complication in using these projected growth rates to contrast the experience of these two prototypical cities during the sixties and the seventies. A comparison of the household growth rates used in the simulations done for the sixties (item 1) with the actual growth

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[10]Bureau of Economic Analysis, U. S. Department of Commerce, Area Economic Projections to 1990 (Washington, D.C.: U.S. Government Printing Office, 1975).

rates (item 2) shows that the first value is only about half of the actual value for the slow-growth city. The problem causing the discrepancy arose in the process of initially constructing the slow-growth city. The procedure focused on matching the growth in low-to-moderate income households in the actual cities with the model households in the hypothetical cities. This focus resulted from the finding of the greater sensitivity of the simulation results to variations in the number of households in this income range rather than to the shifts in the total number of households.[11] In achieving this objective the secondary goal of matching overall growth rates was not attained. For this reason, the comparison for the 1960-70 and 1970-80 experience for the slow-growth city is somewhat imprecise. We would stress, however, that the housing situation of the lower income households--the group with which we are most concerned--would be quite insensitive to the addition of several higher income model households which would probably result principally in the construction of an equal number of new dwellings constructed over the period.

[11]For a full description of the construction of the hypothetical cities, see Chapter 6 of deLeeuw and Struyk, op.cit., a summary of which is given in Section 3 of this paper.

Table C-5

Growth in the Number of Households 1970-80

	High minority cities	
	Rapid-growth	Slow-growth
1. Percentage change in model households 1960-70 used in simulations	25	7
2. Actual percentage change in households, 1960-70	27	13
3. Percentage change in population, 1960-70	23	11
4. Ratio: 2/3	1.17	1.18
5. Percentage change in population, 1970-80	11	6
6. Percentage change in households, 1970-80 (4 * 5)	13	7
7. Model households in 1980		
a. total	46	36
b. distribution by household type		
white, nonelderly families	23	18
white, elderly families/ single individuals	12	9
black, nonelderly families	9	7
black, elderly families/ single individuals	2	2

D. Factor Input Prices

The model requires exogenous information on the average price per unit service of capital (P_c) and operating (P_o) inputs to new housing built over the decade being simulated. In past applications of the model, these data have been derived from the capital and operating costs of units insured under the FHA, Section 203(b) program, the Administration's non-subsidized program for owner-occupied homes in 1-4 unit structures. Note that a technique has been developed for converting the average dwellings insured in a given year into a "standard" dwelling, so that the resultant index is a price index.[12] In the present work, we have again used the FHA data, adjusted as in the past. For comparative purposes, we have also used data from the Bureau of Labor Statistics (BLS) for the owner-occupant component of the Consumer Price Index. One important difference in the two series is that the BLS includes recently purchased new and existing units in its sample, while the comparable FHA sample is for new units only. Additionally, there is likely a good deal of variation in the quality of unit in both samples, our adjustment of the FHA and BLS sampling procedures to the contrary. For these reasons the two series have not moved in lock-step over the period for which we

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[12] See R. Struyk, "A Comparison of FHA and BLS Price Indices of Owner Occupied Housing in Urban Areas," (Washington, D.C.: Urban Institute Working Paper 208-7, 1972).

have data, as shown in Figure C-2.[13]

The general procedure followed in projecting the prices has been to estimate the relationship between P_c or P_o and real GNP, the CPI, or the GNP deflator for the 1959-1973 period using regression analysis. Then the values for P_c and P_o for the 1974-79 period were calculated by taking the values of the independent variables projected by macro-economic models of the entire economy and substituting the values into the regression models.

Table C-6 shows the regression models actually selected. The only independent variable is the CPI. Other models which included additional variables were plagued by severe multicollinearity. For our predictive purposes the autocorrelation evident in all of the models is not a problem.[14] Also, note that while the estimates using the BLS and FHA measures as dependent variables differ significantly statistically, the series themselves for P_o and P_c over the observation period are highly correlated ($r > .9$ in both cases). The projections of the CPI, P_c and P_o are given in Table C-7 (also on page C-18).[15] Interestingly, even though the elasticity of P_c with respect to the CPI is greater than that for P_o, the change in P_o over the decade is greater than P_c due to the jump in P_o between 1970 and 1973.

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[13]The FHA data are from various issues of Housing Production and Mortgage Credit-FHA, U.S. Department of Housing and Urban Development, FHA Homes 1970, (Washington, D.C.: HUD, SOR-2, 1972). Most of the BLS data was found in U.S. Bureau of Labor Statistics, Handbook of Labor Statistics, 1974, (Washington, D.C.: U.S. Government Printing Office, 1974). BLS provided us with unpublished data on the purchase price of homes. The various capital and operating components of the BLS composite index were combined using 1970 weights, published in U.S. Bureau of Labor Statistics, Importance of Components in the Consumer Price Index, 1970-71, (Washington, D.C.: U.S. Government Printing Office, 1972).

[14]The models were estimated using a first order autocorrelation correction technique and for P_c the parameter estimates changed significantly. The prediction of the average P_c for 1970-79, however, changed by less than 5 percent.

[15]The CPI projections are those from Data Resources Incorporated, May 1976.

Figure C-2

COMPARISON OF BLS AND FHA (NEW HOMES)
CAPITAL AND OPERATING COST INDICES

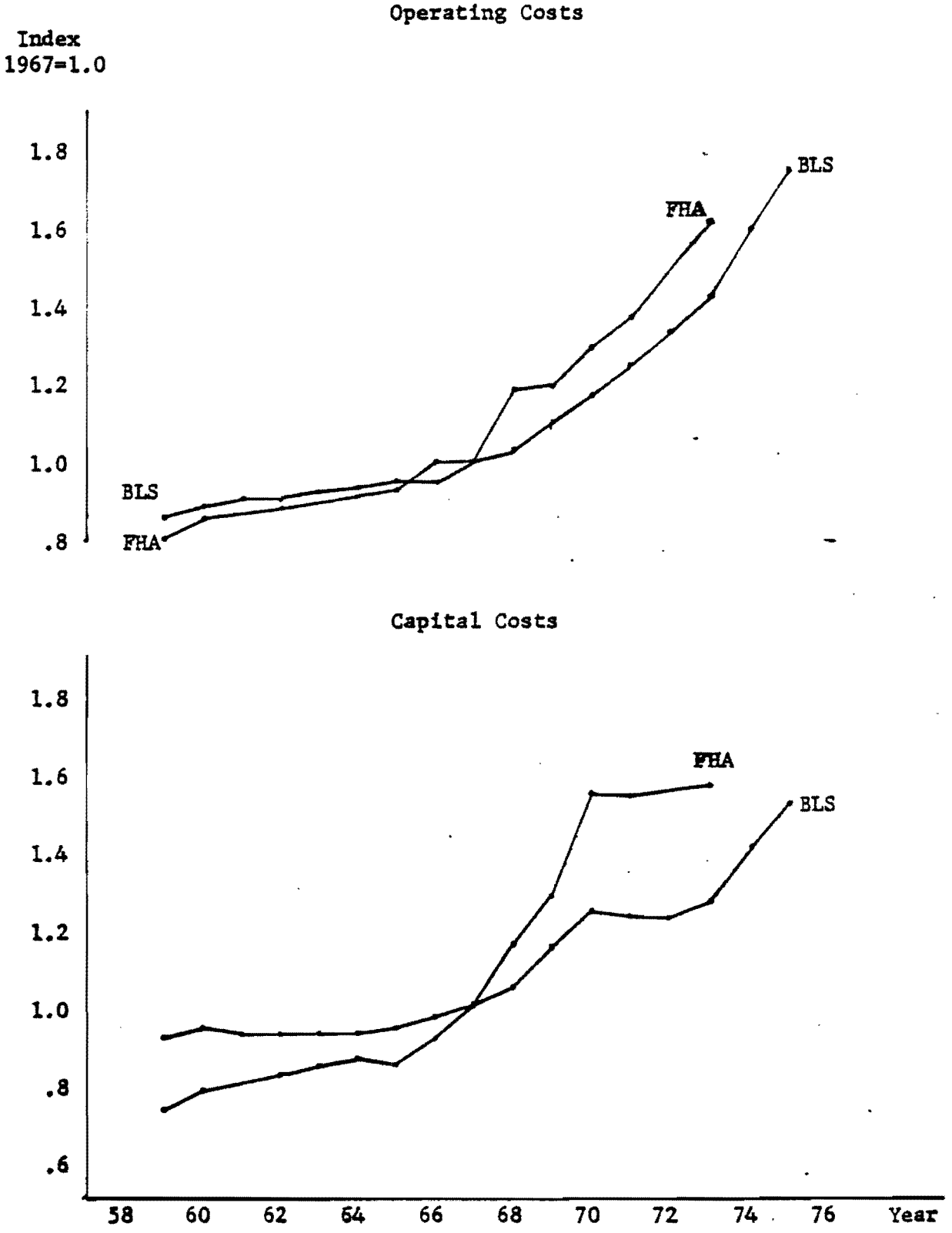

Table C-6

REGRESSION ANALYSIS OF RELATION BETWEEN MOVEMENT IN FACTOR INPUT PRICES AND THE CONSUMER PRICE INDEX

	operating inputs		capital inputs	
	FHA	BLS	FHA	BLS
Constant	-41.3	-21.4	-94.9	8.41
	(7.57)	(6.53)	(6.47)	(.98)
CPI	.97	1.22	1.86	.93
	(19.8)	(39.4)	(13.4)	(11.1)
R^2	.97	.99	.94	.92
F	390	1152	198	123
d.w.	2.77	.84	.96	.85
d.f.	11	11	11	11

Table C-7

PROJECTIONS OF THE CPI, P_c AND P_o to 1979
(1967=100)

	CPI	P_c	P_o
1970	116.3	154.1	128.6
1971	121.3	152.0	136.8
1972	125.3	157.5	161.0
1973	133.3	155.7	161.0
1974	147.7	178.2	190.6
1975	161.2	204.8	215.1
1976	170.5	220.4	232.0
1977	179.8	237.8	248.8
1978	189.2	255.0	265.8
1979	198.2	271.8	282.2
percentage change 1970-79	70.4	76.4	119.4

compared to that in P_c. Our judgment was that the 1979 estimates seem to give a somewhat too large increase over the decade, possibly in the order of 10-15 percent, because the extremely sharp increases of the early 1970s are embodied in the estimated models. As a final step in the estimation of P_c and P_o the values are, as a result, revised downward.

Using the projected data and the average price per unit of service of dwellings in the stock in 1970 as a numeraire, the following average-over-the-decade values--of the type actually used as inputs in the model simulations--were determined.[16]

variable	value
P_c	.94
P_o	1.08
$P_n (=P_c+P_o)$	2.02

This represents a 62 percent increase over the comparable P_n for the 1960-70 decade (P_n = 1.24). The prices just calculated then had to be converted to a 1960 base, since the quantity-of-services distribution defined for 1960, which when updated through the 1960-70 simulations yields the base dwelling distribution of the 1970-80 simulations is dependent on the 1960 average price level. Hence, P_c and P_o were multiplied the ratio of P_n in 1970 to P_n in 1960. Finally we adjust the two prices downward by 15 percent in keeping with our judgment of the upward bias in the basic predictive models. The variable values resulting from this process are: P_c = 1.29 and P_o = 1.50.

[16]See deLeeuw and Struyk, op.cit., Chapter 4, for a full description of these computations.

Appendix D

Full Results of Simulations of the Section 8 Housing Assistance Program

Table D1

A Guide to the Section 8 Simulations

	Case Number[1]	HIGH MINORITY								LOW MINORITY							
		RAPID GROWTH				SLOW GROWTH				RAPID GROWTH				SLOW GROWTH			
		Elastic		Inelastic		Elastic		Inelastic		Elastic		Inelastic		Elastic		Inelastic	
		Proportion New	Proportion Exist.	Proportion New	Proportion Exist.	Proportion New	Proportion Exist.	Proportion New	Proportion Exist.	Proportion New	Proportion Exist.	Proportion New	Proportion Exist.	Proportion New	Proportion Exist.	Proportion New	Proportion Exist.
I. Basic Simulations[2]																	
A. Proportional Allocation Scheme	C1,C2	50	50														
	C3,C4			50	50												
	C5					50	50										
	C6							50	50								
	C7,C8													50	50		
	C9,C10															50	50
	C11									50	50						
	C12											50	50				
b. Fair Share Allocation Scheme	C13	50	50														
	C14			50	50												
	C15					50	50										
	C16							50	50								
II. Policy Variations																	
A. Proportional Allocation Scheme[3]																	
All New	D1	100	0														
All New	D2			100	0												
All New	D3					60	40			100	0						
All New	D4											100	0				
No FMR Ceiling[4]	D5																
No FMR Ceiling	D6																
No FMR Ceiling	D7																
No FMR Ceiling	D8																
B. Fair Share Allocation Scheme																	
1970-1980[5]	D9			60	40												
1970-1980	D10							50	50								
All New	D11	100	0														
All New	D12			100	0												
No FMR Ceiling	D13	50	50														
No FMR Ceiling	D14					50	50										
No FMR Ceiling	D15							50	50								
No FMR Ceiling[6]	D16	50	50														
No FMR Ceiling[6]	D17					50	50										

[1] The case numbers correspond to the case numbers used in the full tables of simulation results presented in Appendices C & D.

[2] All of the basic policy simulations C1-C16 are of a Section 8 program having 50 percent newly constructed units and 50 percent already existing units (50/50)

[3] Program consists of all newly built units.

[4] A 50/50 program simulated without the maximum rent ceiling although a maximum subsidy based on FMR is still in effect.

[5] Simulations projecting Section 8 program from 1970 to 1980.

[6] FMR ceiling and maximum government subsidy restrictions both removed.

Table D2

Full Results - Basic Policy Simulations

	PROPORTIONAL ALLOCATION												FAIR SHARE ALLOCATION			
	HIGH MIN RAPID GROWTH				HIGH MIN SLOW GROWTH		LOW MIN SLOW GROWTH				LOW MIN RAPID GROWTH		HIGH MIN RAPID GROWTH		HIGH MIN SLOW GROWTH	
	Elastic		Inelastic		Elastic	Inelastic	Elastic		Inelastic		Elastic	Inelastic	Elastic	Inelastic	Elastic	Inelastic
Case Number	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
Program Type	C	A	C	A	A	A	C	A	C	A	A	A	A	A	A	A
1. Participation Rate	.50	1.00	.50	1.00	1.00	.50	.50	1.00	.50	1.00	1.00	.80	1.00	.75	1.00	.83
2. Average Subsidy	28.89	23.85	26.92	15.35	33.90	33.13	36.92	27.95	28.90	24.18	27.22	21.28	42.70	38.47	37.99	33.86
3. Earmarking Ratio -New	—	1.58	—	1.88	1.25	1.40	—	1.84	—	1.39	1.16	1.81	1.05	1.54	1.06	1.27
-Existing	.448	.474	.638	.268	.361	--	.479	.460	.379	.376	.437	.611	.641	.676	.645	.817
4. Average percentage change - Quantity of Services																
a. Participants - New	—	26.90	--	26.78	37.83	34.32	--	29.00	--	25.52	28.36	20.83	20.27	21.73	32.61	31.10
-Existing	12.65	20.23	8.01	7.99	20.38	--	21.14	25.09	20.56	28.30	29.73	33.44	71.04	66.76	41.57	24.82
b. All households	.75	2.38	.28	4.73	3.22	3.22	.26	3.83	.30	2.57	3.24	1.97	7.55	3.88	6.37	3.68
5. Percent of change expenditure																
a. Participants - New	--	27.06	--	34.17	47.72	56.63	--	42.05	--	28.83	21.08	22.31	21.65	35.37	41.15	66.76
-Existing	17.36	19.30	25.12	5.23	19.28	--	26.11	24.15	48.74	47.26	22.25	31.31	68.24	74.61	51.26	63.75
b. All households	-.19	1.96	1.00	-.68	2.68	.84	.48	4.34	.94	2.43	4.47	.18	7.56	7.68	9.07	8.92
6. Percent of increase in expenditure attributed to price inflation																
a. Participants	25.11	.53	66.52	14.45	8.94	29.06	20.72	15.45	62.67	25.70	0	5.77	.41	21.07	17.43	43.67
7. Average price per unit of service																
a. Participants																
1. Base	1.193	1.215	1.040	1.103	1.143	1.064	1.152	1.139	.837	1.127	1.231	1.122	1.218	1.083	1.092	.878
2. Policy - New	NP	1.24	NP	1.24	1.24	1.24	NP	1.24	NP	1.24	1.24	1.24	1.24	1.24	1.24	1.24
-Existing	1.245	1.187	1.24	1.006	1.115	NP	1.214	1.157	1.092	1.013	1.147	1.039	1.195	1.069	1.126	.970
b All households																
1. Base	1.230	1.230	1.186	1.186	1.190	1.129	1.216	1.216	1.160	1.160	1.245	1.049	1.230	1.186	1.190	1.129
2. Policy	1.239	1.211	1.208	1.144	1.181	1.100	1.227	1.218	1.178	1.160	1.213	1.024	1.231	1.169	1.214	1.162
8. Number of units withdrawn																
Base	0	0	3	3	3	6	3	3	6	6	0	3	0	3	3	6
Policy	0	2	3	5	5	7	3	5	6	8	3	5	4	6	6	8
9. Number New Units																
Base	9	9	12	12	5	8	7	7	10	10	12	15	9	12	5	8
Policy	9	11	12	14	7	9	7	9	10	12	15	17	13	15	8	10
10. Number blacks in Zone 1																
Base	5	5	6	6	4	4	1	1	2	2	2	1	5	6	4	4
Policy	3	5	6	5	3	4	1	0	2	2	2	1	3	3	4	4

[1] Households have free choice regarding participation and new or existing housing

[2] Some households assigned to new units built under the program

[3] Earmarking ratio is the ratio of the change in housing expenditure to subsidy received

Table D3

Full Results - Section 8 Policy Variations

	PROPORTIONAL								FAIR SHARE								
Program Type	100% New				No FMR Ceiling				1980		100% New		No FMR			[a]	[a]
Growth Rate	RAPID GROWTH				RAPID GROWTH		SLOW GROWTH		RAPID[b]	SLOW	RAPID GROWTH		RAPID	SLOW GROWTH		RAPID	SLOW
Minority Proportion	High Minority		Low Minority		High Minority		Low Minority		High Minority								
Elasticity	E	I	E	I	E	I	E	I	I	I	E	I	E	E	I	E	E
Case Number	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17
1. Participation Rate	1.00	1.00	1.00	1.00	.50	.50	.50	.50	1.00	1.00	1.00	1.00	.75	.833	.833	.875	1.00
2. Average Subsidy	19.29	19.29	22.10	22.10	31.39	27.54	35.84	26.89	50.83	76.13	30.40	30.40	41.44	43.39	31.65	45.59	47.87
3. Earmarking Ratio - New:	1.053	1.545	.697	1.063	--	--	--	--	.778	1.10	.789	1.10	--	--	--	--	--
Existing:	--	--	--	--	.493	.718	.585	.973	.238	.773	--	--	.660	.742	1.028	.725	.819
4. Average Percent Change Q																	
a. Participants - New:	20.27	21.75	17.06	19.78	--	--	--	--	4.26	15.55	28.81	27.13	--	--	--	--	--
Existing:	--	--	--	--	15.34	8.94	22.24	20.66	17.46	43.22	--	--	31.65	36.46	22.36	44.11	43.83
b. All Households	2.45	2.266	2.17	3.21	.09	.42	.51	.25	1.19	2.18	2.77	5.57	2.21	2.04	1.03	2.01	2.97
5. Average % Change: Expend.																	
a. Participants - New:	22.06	35.38	16.26	26.14	--	--	--	--	20.11	17.21	30.95	49.30	43.17	55.30	71.47	48.94	59.99
Existing:	--	--	--	--	20.76	28.21	30.00	44.89	8.10	51.55	--	--	--	--	--	--	--
b. All Households	.63	1.486	1.732	2.12	.16	1.41	.89	.79	3.82	5.36	3.01	4.30	2.79	3.44	3.49	2.18	4.56
6. Percent of Increase - Expend. ⟶ Inflation:																	
a. Participants	5.18	31.68	0	20.13	23.79	65.15	24.59	60.42	41.62	7.29	5.30	35.34	21.12	30.27	56.95	6.76	14.96
7. Average Price Per Unit of Service																	
a. Participants																	
1. Base	1.226	1.115	1.245	1.178	1.193	1.040	1.152	.837	2.405	2.391	1.220	1.056	1.214	1.069	.794	1.215	1.092
2. Policy - New:	1.24	1.24	1.24	1.24	--	--	--	--	2.780	2.780	1.24	1.24	--	--	--	--	--
Existing:	--	--	--	--	1.252	1.233	1.237	1.064	2.210	2.172	--	--	1.325	1.248	1.117	1.256	1.190
b. All Households																	
1. Base	1.230	1.186	1.245	1.049	1.230	1.186	1.216	1.160	2.657	2.502	1.230	1.186	1.230	1.190	1.129	1.230	1.190
2. Policy	1.236	1.199	1.231	1.217	1.236	1.212	1.226	1.176	2.637	2.532	1.204	1.246	1.247	1.230	1.190	1.2	1.233
8. # Units Withdrawn																	
a. Base	0	3	0	3	0	3	3	6	1	0	0	3	0	3	6	0	3
b. Policy	4	7	5	8	0	3	3	6	6	5	8	11	3	4	6	4	5
9. # New Units																	
a. Base	9	12	12	15	9	12	7	10	7	3	9	12	9	5	8	9	5
b. Policy	13	16	17	20	9	12	7	10	12	8	17	20	12	6	8	14	7
10. # Blacks in Zone 1																	
a. Base	5	6	2	1	5	6	1	2	4	2	5	6	5	4	4	5	4
b. Policy	5	5	1	1	3	6	0	2	4	1	5	4	3	3	4	3	3

Note: In Cases D5-D8 and D13-D17 all households are free to choose between new units and existing units. In the other cases, D1-D4 and D9-D12 some households are exogenously assigned to new units.

[a] No Fair Market Rent Ceiling or maximum subsidy.
[b] 60-40 mix of new and existing units under the program.

Appendix E

The Demand for Existing Section 8 Units

In four cases where all households are allowed free choice, acceptable solutions were not reached. When none of the eligible households choose new units intense demand pressure is concentrated on existing units qualifying for Section 8. Figure 2 illustrates.

Existing dwellings qualifying for Section 8 subsidies must be to the right (greater than) ab or 45 units of service, which is the minimum quality standard imposed by the program. The unit must also be below the hyperbola, ab, which gives constant expenditure combinations of price times quantity equal to the Fair Market Rent. The demand for non subsidized units usually keeps price of dwellings with output (Q) of 65 units or above (the minimum quality standard for new units) around Pn, the price per unit of service of a new unit. Thus, only units inside the area abcd meet both of the Section 8 requirements. Consequently, a strong increase in demand may create more pressure than the relevant range of existing units can bear. For example, if two or more households bid for the same dwelling, the landlord moves up his supply curve, SS' in the figure, until rent exceeds FMR. The dwelling becomes ineligible for a subsidy and the eligible households are no longer interested in it. The rent then drops below FMR and the bidding among eligible households starts again. The process can be repeated until the algorithm runs out of time without having every household the unique occupant of the dwelling of its choice. This "boxing in" of the demand for eligible Section 8 units is one of the reasons for removing the Fair Market Rent ceiling in one set of simulations. In the real world counterpart to this situation, the owner of the contested unit would probably choose between the competing households on a first come, first served basis.

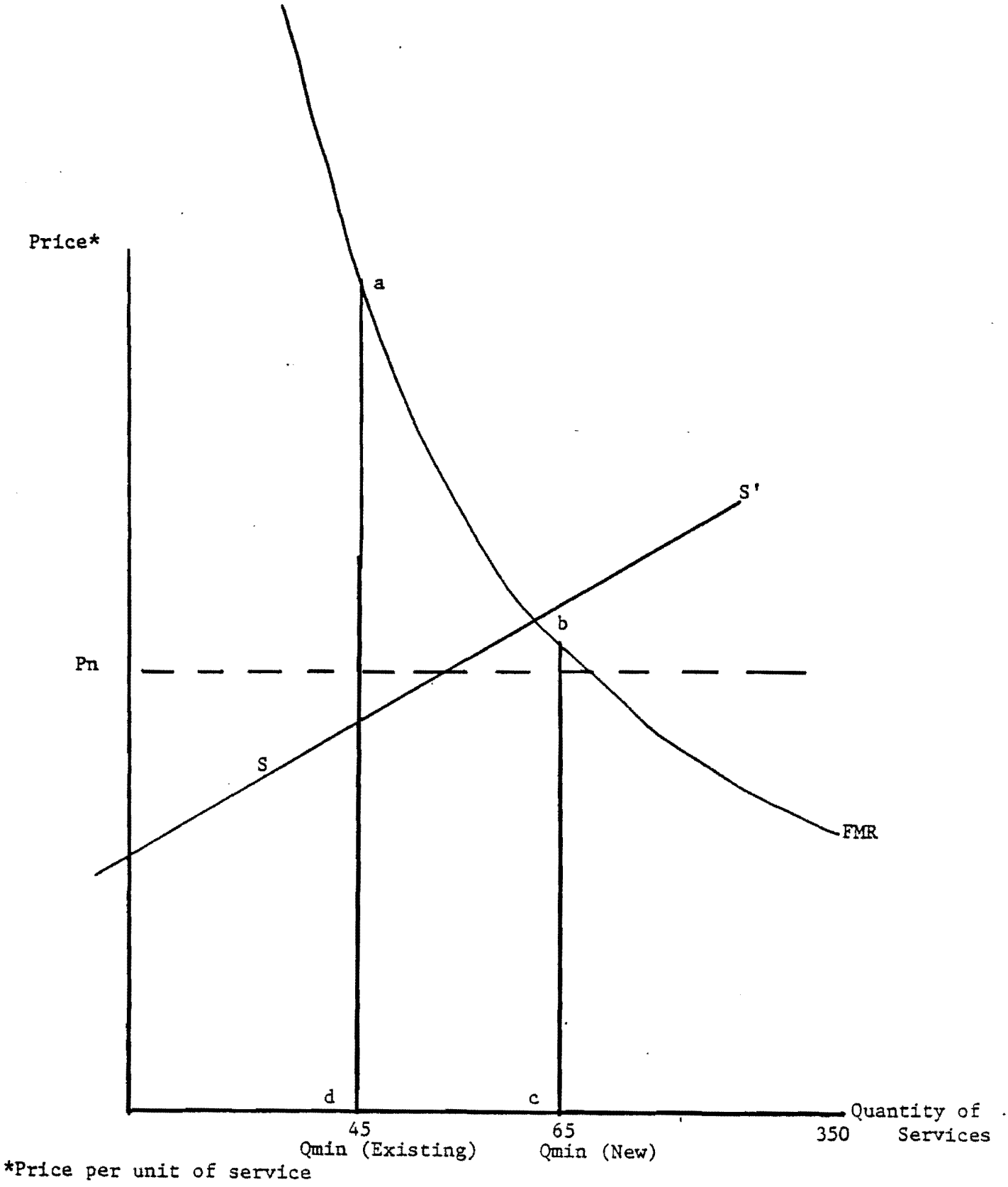

Figure E-1
The Demand for Existing Section 8 Units

APPENDIX F

COMPARISON OF MARKET EFFECTS OF ALTERNATIVE HOUSING PROGRAMS IN TWO TYPES OF CITIES

The notes referenced by the superscripts on Tables F-1 and F-2 are given in Table 6.2.

TABLE F-1

CLOTH: HIGH MINORITY, RAPID GROWTH [a]
(ELASTIC SUPPLY OF HOUSING)

	Housing Allowance	Small Income Maintenance	Across-the-Board Construction Subsidy	1-step Construction Subsidy Housing Allowance	Rehabilitation Subsidy with Housing Allowance	Public Housing	Section 8 Proportional Assignment	Large Income Maintenance	Large 1-step Construction Subsidy	Large 2-step Construction
Impact on Participants [d]										
Average Monthly Subsidy	$31	$31	b	$27	$22	$139	$24	$102	b	b
Participation Rate	1.0	1.0		1.0	1.0	1.0	1.0	1.0		
Earmarking Ratio [e]	.51	.33		.62	.61	c	1.03	.15		
Percent Change in Housing Expense	+24	+15		+26	+38	c	+23	+20		
Percent Change in Housing Quantity	+19	+10		+29	+30	+108	+24	+19		
Percent Change in Housing Price	+4	+5		-2	+7	c	+1	+2		
Price Level Before Policy	1.210	1.210		1.207	1.207	.239	1.215	1.216		
Price After Policy	1.259	1.269		1.181	1.287	c	1.214	1.236		
Number of Model Participants	10	10		7	7	2	4	11		
Impact on Target Population [f]										
Percent Change in Housing Expense	+24	+15	-3	+13	+24	c	+7	+27	-12	-19
Percent Change in Housing Quantity	+19	+10	+8	+17	+20	+16	+12	+21	+8	+3
Percent Change in Housing Price	+4	+5	-10	-4	+4	c	-5	+5	-18	-22
Price Level Before Policy	1.209	1.209	1.209	1.209	1.209	1.209	1.209	1.209	1.209	1.209
Price After Policy	1.259	1.269	1.086	1.162	1.254	c	1.152	1.269	.988	.948
Impact on All Households										
Price Level Before Policy	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
Price After Policy	1.243	1.24	1.14	1.17	1.23		1.211	1.24	1.08	1.06
Change in Number of Model Units Withdrawn	+3	+1	+5	+3	0	+2	+2	+3	+5	+5
Change in Number of New Model Units	+3	+1	+5	+3	0	+2	+2	+3	+5	+5
Change in Number of Black Model Households										
Zone 1	0	0	+1	0	+1	0	0	-1	0	-2
Zone 2-5	0	0	-1	0	-1	0	0	+1	0	+2
Costs as a Percent of Housing Allowance Costs [h]	100	100	59	97	86	90	31	36	83	89

TABLE F-2

GRAIN: LOW MINORITY, SLOW GROWTH[a]
(INELASTIC SUPPLY OF HOUSING)

	Housing Allowance	Small Income Maintenance	Across-the-Board Construction Subsidy	1-step Construction Subsidy Housing Allowance	Rehabilitation Subsidy with Housing Allowance	Public Housing	Section 8 Proportional Assignment	Large Income Maintenance	Large 1-step Construction Subsidy	Large 2-step Construction Subsidy
Impact on Participants[d]										
Average Monthly Subsidy	$26	$30	b	$22	$22	$143	$24	$103	b	b
Participation Rate	.86	1.0		1.0	.75	1.0	1.0	1.0		
Earmarking Ratio[e]	.98	.23		.23	.78	c	.88	.08		
Percent Change in Housing Expense	+46	+14		+35	+65	c	+38	+45		
Percent Change in Housing Quantity	+15	+4		+21	+38	+82	+27	+14		
Percent Change in Housing Price	+31	+10		+19	+20	c	+10	+28		
Price Level Before Policy	.903	.858		.771	.766	.603	1.122	.872		
Price After Policy	1.186	.941		.919	.920	c	1.140	1.113		
Number of Model Participants	6	7		5	3	2	4	7		
Impact on Target Population[f]										
Percent Change in Housing Expense	+44	+14	-17	+23	+19	c	+22	+48	-25	-14
Percent Change in Housing Quantity	+12	+4	-2	+10	+18	-18	+16	+14	-29	+5
Percent Change in Housing Price	+28	+10	-15	+11	+1	c	+5	+29	-23	-18
Price Level Before Policy	.858	.858	.858	.858	.858	.858	.858	.858	.858	.858
Price After Policy	1.101	.941	.731	.955	.863	c	.900	1.109	.660	.703
Impact on All Households										
Price Level Before Policy	1.160	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Price After Policy	1.212	1.18	1.06	1.13	1.13	1.160	1.16	1.21	1.02	1.03
Change in Number of New Model Units	0	0	+1	+1	-2	+2	+2	0	+2	+3
Change in Number of Black Model Neighborhoods										
Zone 1	0	0	+1	0	0	+1	0	-1	-1	0
Zone 2-5	0	0	-1	0	0	-1	0	+1	+1	0
Costs as a Percent of Housing Allowance Costs[h]	100	135	127	146	114	183	62	463	148	174