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A WELFARE ECONOMIC EVALUATION OF PUBLIC HOUSING

by

Edgar O. Olsen

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INTRODUCTION

The federal public housing program had its origin in essentially its present form in the United States Housing Act of 1937. Federal government entry into the low-rent housing field began earlier in the Great Depression as a means to stimulate employment. However, the inefficacy of this method soon became evident and by the time of the Housing Act of 1937 the emphasis was clearly on the provision of good homes and healthful living conditions for low-income families.

By 1965, there were 600,000 public housing units occupied by more than 2,000,000 people. The resource cost (expressed as an annual flow) actually involved in producing the stream of service emitted by public housing units was $786,528,000 in 1965. Public housing tenants paid 43% of this cost. The taxpayers directly or indirectly bore 57% [= $448,128,000] of the cost. Only $237,810,073 was reported as a cost of the program in the Annual Report of the U.S. Department of Housing and Urban Development. The remaining $210,317,927 is primarily attributable to the tax exempt status of the interest earned on local authority bonds and to the transfer of housing to the Public Housing Administration (PHA) from other agencies without monetary consideration.¹

Public housing is a program of subsidies-in-kind with an explicitly redistributive intent. From the point of view of this dissertation, the calculations of this paragraph are made in the appendix to Chapter IV.
this is its most interesting characteristic. Economists have had little success in expanding welfare economics in order to evaluate government subsidies-in-kind of a redistributive nature. In fact, some economists appear to regard transfers to low-income families in the form of specific commodities as necessarily inefficient while other economists who support these programs have developed rationalizations for such programs inconsistent with the general normative theory which they apply to other activities. As a result, the PHA and similar agencies have escaped a probing evaluation of their performance.

Fortunately, the resurgence of normative public expenditure theory since the work of Paul A. Samuelson and including especially the work of Richard A. Musgrave and James M. Buchanan has laid the foundation for theoretical and empirical normative analysis of such government activities. This new normative public expenditure theory is an extension of Paretoian welfare economics to activities which are valued by individuals but which will not be provided in the right amount through the market mechanism. The welfare economic evaluation of public housing in this dissertation is based on a further extension of this new normative public expenditure theory.

The plan of the dissertation is as follows. Chapter I begins with a brief critique of existing normative theories of transfers. The simple extension of welfare economics on which the estimates of waste are based is then outlined. It is argued that transfers in kind and in cash are justified by well-known motivations of
individuals just as are the production and consumption of food. These motives can be expressed in individual preference functions as specific arguments. A normative theory of transfers is developed based on the preferences of individuals and the existing distribution of ownership of productive factors. In this framework, transfers in kind and in cash are necessary for efficient resource allocation.

Chapter II critically examines the justifications for public housing in terms of specific kinds of market failure. Market imperfections of the traditional sort are dismissed as unlikely. The examination of market failure due to externalities does suggest that housing service for low-income families enters either directly or indirectly in the preference functions of some high-income families.

Chapter III describes a normative model applicable to the evaluation of subsidies-in-kind in general and public housing in particular. Several theorems concerning how the optimal transfer to a family varies with the income of the recipient, the income of the taxpayer, and the cost of production of the transfer activity are proven. The conclusions of these theorems are similar to, but weaker than, familiar normative statements in the literature.

Based on the positive theory of the housing market developed in Chapter II and the normative theory of transfers developed in Chapters I and III, the optimal method for providing housing subsidies to low-income households is proposed and defended against criticism from housing specialists. This is Chapter IV.
The extension of welfare economics proposed in Chapters I and III permits the use of consumers' surplus analysis to choose between alternative means of satisfying specific redistributive wants. In Chapter V, two pairs of alternative means are considered in detail: (1) public versus private production of housing service and (2) a pattern of subsidies in which 7 of 100 equally eligible families receive a large subsidy while 93 of the 100 receive nothing versus a pattern of subsidies in which all equally eligible families receive the same subsidy. In both cases the existing means of conducting the program appear to be quite inefficient compared with the proposed means. The results of this chapter should help to explain why the public housing program has been consistently embattled since its inception and almost terminated on several occasions. They also suggest changes in the present method of conducting the public housing program which would benefit many and harm none.
Chapter I

A NORMATIVE THEORY OF TRANSFERS

This dissertation began as an attempt to apply modern welfare economics to the evaluation of an existing program of housing subsidies to low-income families in the United States. Gradually it became clear that the way in which preferences that justify transfers between individuals are handled in modern welfare economics made this evaluation impossible. To my knowledge, there is no acceptable normative theory of transfers which even at the conceptual level answers the questions for which such a theory is intended. How much? From whom? To whom? In what form? The theory to be presented in this chapter conceptually answers all of these questions. Of equal importance, this theory makes possible a welfare economic evaluation of government programs of a redistributive nature. It allows us to choose between alternative means of achieving specific redistributive ends in a Pareitian welfare economics framework.

A Critique of Existing Theories

In the literature of welfare economics, there are two prominent normative theories of distribution. One of these theories culminates in Abba Lerner's famous proof that "the maximization of probable total satisfaction is attained by an equal distribution of income." Milton Friedman has shown that the assumptions necessary for a rigorous proof

of this theorem are much stronger than Lerner had realized. Of much more importance, Lerner's assumption that there will be no disincentive effects of a tax system with a marginal rate of .9999 ... at all income levels seems to be miles from reality. Only work which is enjoyed for its own sake would be done.

Once the significant disincentive effects of income equalization are admitted, the Lerner solution is not Pareto optimal. Starting from a situation in which each individual undertakes only those productive activities that he finds to be enjoyable, each individual would prefer to consume less leisure and more of the goods purchasable directly with money. With a marginal tax rate of .9999 ..., the individual would obtain virtually none of the rewards from harder work and, hence, he would not undertake it. However, each individual would have an incentive to bribe his fellows to exempt him from this high marginal tax rate. Because his fellow men also prefer more to less, they will have an incentive to accept some bribe. Everyone can be made better off by moving from the Lerner solution to a solution at which output is greater but income is not necessarily equally distributed. To reiterate, the Pareto relevant disincentive effects of income equalization independent of individual preferences are too important to ignore and, when they are not ignored, equal distribution of income is not consistent with

the maximization of probable total satisfaction.³ Probably as a result of this consideration, Lerner's theory has had little perceptible impact on practical affairs.⁴

The other prominent normative theory is Paul Samuelson's version of the new welfare economics.⁵ Starting from a fixed total amount of each productive factor, the preference fields of all individuals, and a given technology, Samuelson shows that there are an infinite number of patterns of resource allocation which are Pareto optimal. Consequently, there are an infinite number of distributions of welfare which are Pareto optimal. In order to select one of these points as the social optimum, Samuelson posits a social welfare function which depends only on the ordinal preferences of all individuals.

Some informed scholars believe that Samuelson's formulation answers

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³ The term "Pareto relevant" is used to recognize that the fact that less work is done under some particular combination of taxes and government expenditures than under another combination does not imply that the former allocation of resources is not Pareto optimal.

⁴ This paragraph is a heuristic statement of the conclusion of a theorem. It is not a proof. Indeed, I am aware of no proof of this theorem.

the four questions conceptually.\footnote{This formulation meets the test of theoretical rigor and sweeping elegance and ranks among the great contributions to the theory of welfare economics as applies to public finance.} Richard A. Musgrave, "Provision for Social Goods," paper presented at a conference of the International Economic Association at Biarritz in September 1966, p. 10.

In fact, it answers these questions from the point of view of the tastes for transfers of only one individual. His theory gives the state of the world preferred by only one member of society. As Samuelson himself points out, the state of the world preferred by the millions of other members will be different.\footnote{It is not a 'scientific' task of the economist to 'deduce' the form of this function; this can have as many forms as there are possible ethical views ....} Paul A. Samuelson, "The Pure Theory of Public Expenditure," Review of Economics and Statistics, XXXVI (November, 1954), p. 387.
transformation between these goods. Since the equality of these marginal rates is necessary for efficient resource allocation, the result of redistribution independent of individual preferences is inefficiency.

The suggestion that the taxes and subsidies can be of a lump sum variety with no distortive effects would seem to be inconsistent with stable behavior functions and a stable social welfare function. If the social welfare function is stable and if the utilities possibilities surface expands steadily, then a systematic relationship between individual effort and the amount of individual (net) tax would become established and anticipated by individuals. In short, Samuelson's solution seems to be characterized by Pareto relevant disincentive effects of a magnitude which can be specified as soon as a particular social welfare function is posited.\(^8\)

In general, normative theories which separate equity and efficiency and use different principles to determine the optimal allocation of resources and distribution of welfare seem to yield a solution which is not Pareto optimal because of relevant disincentive effects. This statement seems to be true of Lerner's and Samuelson's theories. It would seem to be a contradiction in terms to characterize a situation in which it is possible to make everyone better off as socially optimal.

Because the existing normative distribution theory is so inadequate, the evaluation of government programs with redistributive objectives has lagged behind the evaluation of other government programs. In support

\(^8\) Again these are heuristic arguments not proofs.
of redistributive programs most writers resort to vague reference to equity. \(^9\) Unfortunately, this approach gives us no help in choosing between alternative means of achieving redistribution. The theory developed in this dissertation suggests the use of consumers' and resource owners' surplus analysis to make these choices. The application of this approach to specific issues in public housing in Chapter IV illustrates the usefulness of the theory.

An Extension of Existing Theories

It is strange that an acceptable normative theory of transfers has not been developed since it seems to be easy to construct a theory based on the motives for transfers which appear throughout the literature on government policy. The approach adopted here is straightforward. Individual wants which justify transfers are represented by arguments in individual preference functions and subjected to the same budget constraint as other wants. For example, if an individual values "equity," then it should be possible to incorporate this sentiment in his preference function. If no individuals value equity, then equity

\(^9\) The following assumption from a recent article is typical. "I assume that there is a widely held value judgment which enables us to say that society prefers a more equal distribution, ceteris paribus, over a less equal distribution, at least for small changes from the present distribution." A. Myrick Freeman III, "Income Distribution and Planning for Public Investment," American Economic Review, LVII (June, 1967), pp. 495-96. In other words, Freeman believes that the political system always generates an amount of transfers from the rich to the poor which is less than optimal. In the absence of a positive theory of the political process and a normative theory of transfers, it is difficult to place much confidence in Freeman's assumption.
cannot be used to justify transfers. In this framework, the quantity of these transfer activities demanded by an individual depends on the prices of all goods to him, his initial endowment of productive factors, and his tastes for the various activities. It is assumed that the preference maps including these new activities have the same general properties assumed for preference maps with only ordinary goods. Consequently, it is assumed that the quantity of a transfer activity demanded by an individual varies directly with his wealth and inversely with its price to him.

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This obvious extension of welfare economics is most clearly foreseen by James Buchanan in his review of Richard Musgrave's, The Theory of Public Finance. "It seems clear that if individual evaluations are to count in the determination of the share of resources to be devoted to the public sector, they should also be counted in determining the amount of redistribution that is to be carried out through the fiscal process..." James Buchanan, "The Theory of Public Finance," *Southern Economic Journal*, XXVI (January, 1960), p. 236. This suggestion has been largely ignored in the literature. A few months earlier Buchanan had said that the "existence of voluntary charity indicates that individuals, are, in fact, willing to reduce their own incomes in order to increase those of others. And the peculiar nature of collective choice makes support for collective or government action perhaps even more likely. Many individuals may find themselves saying: 'I should be willing to support this proposal provided that other equally situated individuals do likewise.' Thus collective action may command relatively widespread support, whereas no voluntary action might be taken in its absence." James Buchanan, "Positive Economics, Welfare Economics, and Political Economy," *Journal of Law and Economics*, II (October, 1959), p. 130. Finally, Richard Musgrave appears to be moving with some hesitation in this direction. "Many of the phenomena which appear to be of the merit good type can actually be explained by interdependence of utilities." Musgrave, "Provision for Social Goods," p. 31.

Clearly, this is a positive statement. It is a potentially testable hypothesis. Hence, the theory developed in this dissertation contains both normative and positive elements.
Let us now explicitly represent the suggested preference functions in their most general form and introduce the type of diagram which results from this formulation and is used repeatedly throughout the dissertation. The welfare of the $i$th individual is assumed to depend upon his consumption of $m$ ordinary private consumption goods $(x_i^1, \ldots, x_i^m)$, of $n$ ordinary collective consumption goods $(x_{m+1}^i, \ldots, x_{m+n}^i)$, and of $p$ transfer activities $(T_1^i, \ldots, T_p^i)$.

\[ U_i = f_i(x_1^i, \ldots, x_m^i; x_{m+1}^i, \ldots, x_{m+n}^i; T_1^i, \ldots, T_p^i) \]

These transfer activities might include the quantity of bread consumed by some one other person, the total quantity of educational services consumed by all members of society, the wage income earned by some other person, and the purchasing power available to another individual.

With the aid of a simple diagram, let us answer the four questions --how much, to whom, from whom, in what form--which a normative theory of transfers must answer. Suppose that there are three individuals in society who have a demand for the transfer activity. Since transfer activities are assumed to enter preference functions as do ordinary goods, the quantity of particular activity demanded by the $i$th individual depends on his wealth, the prices of all goods to him, and his tastes. Holding all factors but the price of the activity to the individual constant, we get the familiar demand curves of economic

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12 It is not necessary for this theory that all individuals value all of the transfer activities. This assumption is only introduced to simplify the notation.
theory. These are denoted by $D_1, D_2, D_3$ in Figure 1. Since each transfer activity is a collective good, these demand curves are added vertically to obtain the total demand for this activity denoted by $D$. Suppose that the supply curve for this activity is perfectly elastic at price $0e$. Since $0e$ is the marginal resource cost of this activity at all levels of output, the optimal output is $0a$.

In order to answer the four questions it is necessary to make some assumption about the pricing of goods not completely subject to the exclusion principle. As Johansen has shown in the case of pure collective goods, there are an infinite number of Pareto optimal allocations associated with each set of preferences, technology, and distribution of ownership of productive factors. This result

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The reason for the vertical addition of these demand curves is lucidly explained by Paul A. Samuelson, "Diagrammatic Exposition ...," pp. 353-54. In models with both private and collective goods, the necessary condition for Pareto optimality for a private good is equality of the marginal rate of substitution between the good and a numeraire good for each individual and the marginal rate of transformation between these goods. The necessary condition for a collective good is the equality of the sum of the marginal rates of substitution over all individuals and the marginal rate of transformation. Intuitively, the total demand curve for a good tells us the value to society of an additional unit of the good at each level of output. In the case of private goods where only one individual can consume the additional unit, it is the value that the single highest bidder is willing to pay. However, in the case of collective goods where many people benefit from the consumption of an additional unit, it is the sum of the values that these people place on the extension of the activity.

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FIGURE 1
is due to the fact that the quantity of each productive factor owned by an individual does not uniquely establish his budget constraint. It is also necessary to specify the prices of outputs and inputs to him. In models with only private goods, the competitive market prices of all goods are assumed to be the proper prices because they are a necessary part of the only mechanism known through which an efficient resource allocation can be achieve. In models with goods not subject to the exclusion principle, there is no price with an analogous role. For the purposes of this dissertation, pricing by marginal evaluation (i.e., benefit taxation) is assumed for goods not completely subject to the exclusion principle. Therefore, another normative assumption is added to the theory. As will be demonstrated in Chapter III, benefit taxation is feasible for the private benefits of semi-collective action, the individual benefits were of sufficient magnitude to result in a market for the good.\textsuperscript{15} In particular, it is feasible for some of the benefits of public housing, urban renewal, public education, public health, medicare, and food stamps.\textsuperscript{16,17}

\textsuperscript{15} By semi-collective goods, I mean goods which appear in more than one person's utility function.


\textsuperscript{17} Musgrave, "Provision for Social Goods," pp. 16-17, also supports the use of benefit taxation in the analysis of public policy in order to separate allocative and distributive issues.
Returning to Figure 1, the first person's marginal evaluation of the transfer activity at its optimal level is $O_e$, the second person's is zero, and the third person's is $O_g(=fe)$. Consequently, benefit taxation requires that the first person pay $Oacf$ and the third person pay $Oabg(=fcde)$. These two payments combined just suffice to pay the total cost $Oade$.

If the transfer is to some fourth individual who does not have a private demand for the activity, then $Oade$ should be transferred to this fourth person in the form of units of the transfer activity. The first individual should pay $Oacf$ and third, $Oabg$ of the total cost. If instead the transfer activity is a good which will be consumed directly by one of the individuals, say the first, then $Oabg$ should be taken from the third individual and used to induce the first individual to extend his consumption of the activity from $O_h$ to $O_a$. These are the answers to our four questions in very abstract terms.

It should be clear that in this normative distribution theory it is the individuals who have a taste for transfer activities who pay to have this taste satisfied. The payment depends in part on the intensity of the taste. Rather than discuss the most general model further, the specific model relevant to subsidies in kind is developed in detail in Chapter III.

There are many motives which justify transfers in cash and in kind. However, few of the motives mentioned in the literature have been incorporated in formal normative models. There are some recent exceptions. Richard Musgrave and Mark Pauly justify subsidies in
the form of educational services by the value that some individuals
place on the improved citizenship of others, the altruism of some
individuals, and the increased pleasantness of the social environment.
They constructed identical models to reflect these motives.\textsuperscript{18} Within
the same formal model, these subsidies could be additionally justified
by individual preferences for greater equality of opportunity. In
this dissertation, paternalistic altruism is suggested as one motive
for housing subsidies to low-income households. If improved housing
for low-income families results in lesser losses from crime, illness
or fire by high-income families, then greater subsidies would be
justified.

There is nothing novel about using these motives to justify
the particular subsidies-in-kind. The novelty involves representing
these motives as arguments in individual preference functions and
deriving the implications of this formulation in a formal model. In
this framework, all of the relevant questions—how much, from whom,
to whom, in what form—can be answered conceptually. More importantly,

\textsuperscript{18} Musgrave, "Provision for Social Goods," pp. 22-29 and Mark
Economic Review, LVII (March, 1967), pp. 120-130. The specific
model which I use for housing subsidies to low-income families is
formally identical with their model. However, the motives are
different. This model appears to be the general model appropriate
for subsidies-in-kind. With this broader view of individual
preference functions, it is easy to justify all of Musgrave's
examples of merit wants. See Richard Musgrave, The Theory of Public
approach does not support Musgrave's claim [p. 13] that merit wants
are subject to the exclusion principle. Only the private benefits
are subject to the exclusion principle. There are necessarily social
benefits not subject to exclusion. Further this approach does not
support Musgrave's characterization [p. 14] of merit wants in elitist
terms.
even without empirical estimates of the magnitudes involved, the theory has useful policy implications.

The normative theory outlined in this chapter is in the tradition of Lindahl, Bowen, Musgrave, Samuelson and Buchanan. However, it differs from this tradition (with the exception of Buchanan) in two important respects. First, the wants which justify transfers are incorporated in individual preference functions and subjected to the same budget constraint as other wants. The optimal pattern of transfers is treated as part of the problem of efficient resource allocation rather than as a separate problem to be handled in an entirely different manner than efficient resource allocation. Second, the existing distribution of ownership of productive factors is accepted as a constraint on the maximization problem just as are the existing technology and the existing individual preference functions. There would seem to be no justification for a redistribution of wealth except to the extent justified by individual preferences. There would also seem to be no reason to subject these preferences to a different budget constraint than other preferences. This is one of the value judgments of the normative theory presented here.

It is hoped that recognition of the many different motives for transfers will lead to a more realistic normative theory of distribution and that the use of formal welfare economics models will lead to more rigorous government policy analysis.

Chapter II

JUSTIFICATIONS FOR PUBLIC HOUSING

In the welfare economics framework of this dissertation, the only justifications for collective action are the non-competitiveness of the market and the existence of externalities which cannot be internalized by purely individualistic action.\(^1\) However, market imperfections and externalities are a mixed bag of phenomena, and the appropriate government policy depends on the exact nature of the market imperfections and externalities.\(^2\) Consequently, in evaluating a particular government program such as public housing, it is important to carefully examine the nature of the market failures which justify it.

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\(^1\) James M. Buchanan and Gordon Tullock, *The Calculus of Consent* (Ann Arbor: The University of Michigan Press, 1965), especially Chapter 5, show the inadequacy of this traditional welfare economics framework. They amply demonstrate that if there were no decision-making costs of (coercive) collective action, then purely individualistic and voluntary co-operative actions would result in efficient resource allocation. Hence, the existence of decision-making costs of collective action is a necessary condition for justifying coercive collective action in the framework of Paretoian welfare economics. The existing welfare economics ignores decision-making costs of collective action and, therefore, the solution specified by the existing theory is not attainable by means of any set of institutions known. However, the Buchanan and Tullock approach suggests a method for choosing between alternative sets of political and economic institutions. In particular, the set of institutions which results in the minimum waste as measured by the traditional welfare economics as extended in this dissertation should be chosen. Chapter IV contains some of the relevant estimates of waste.

\(^2\) In what follows, market imperfections is used synonymously with non-competitiveness. Market failure is a broader term including both market imperfections and externalities.
Although the justifications for public housing are not typically discussed in the framework of Paretian welfare economics, many allegations of market imperfections and two types of externalities which might justify housing subsidies to low-income households can be gleaned from the literature on government housing policy. First, some of the particular features of public housing (e.g., public production of housing service) have been supported by assertions of market imperfections in the usual sense of this phrase.\(^3\) These arguments, if correct, might justify housing subsidies to low-income households. Second, better housing for low-income families is alleged to confer tangible benefits on other members of society. In particular, it is argued that better housing for our poorer citizens will result in lesser losses from crime, illness and fire by our more well-to-do citizens.\(^4\) Consequently, it might be worthwhile for these others to subsidize better housing for the poor. Third, some people in our society are altruistic. Many of these people are also paternalistic. As a result, they value the increased consumption of housing service by some other individuals. Although this externality is seldom stated explicitly, it appears to

\(^3\) The most popular current allegation is that the poor pay more for housing in the private market. One among many similar references is Alvin L. Schorr, *Slums and Social Insecurity* (London: Thomas Nelson and Sons, 1964), p. 102.

be the primary motivation of active supporters of public housing.\(^5\)

Let us examine each justification in detail.

Market Imperfections

The central theorem of welfare economics proves that, under
certain well-specified assumptions, the actions of consumers and
producers operating through the price-market system lead to a Pareto
optimal allocation of resources. One of these assumptions is that
all goods are completely private. Until quite recently, market
failure has usually referred to the failure to achieve efficient
resource allocation because of the invalidity of the other assump-
tions. In this section the possibility that public housing may be
justified by market imperfections in this more traditional sense
is considered. In the following two sections, allegations of market
failure in the broader sense (i.e., attributable to interdependent
utility functions) will be examined.

\(^5\) The following quote from W. A. Lewis, *The Principles of Economic
Planning* (London: D. Dobson, 1951), p. 32 is one of the very rare
explicit statements of this motive. "If the government simultaneously
abolished housing subsidies and cut working class taxation by an amount
equal to the subsidies, the working class would be no worse off finan-
cially; but they would then without any doubt prefer to spend the money
in other ways than on housing, and would live in overcrowded and inade-
quately provided houses, some because they do not know the advantages
of the better housing, and others because they value these advantages
too lightly in comparison with other ways of spending their money. That
is the case, and the only case for housing subsidies, and it is put here
in its crudest form because the matter is so often discussed in left-
wing literature without facing reality."
There have been very few scholarly publications devoted to the theoretical explanation and/or empirical documentation of imperfections in the market for housing service. However, the literature on housing contains many phrases, sentences and short arguments which suggest imperfections in the functioning of this market. The primary method of "proving" market failure is by reference to certain real and imagined results of market organization rather than by direct reference to the sufficient conditions for the optimality of market organization.

Several examples of this method will illustrate the approach. Either we directly observe that the poor get worse housing than the rich for the same total expenditure or we directly observe that slum landlords make excess profits. We observe that the total cost of new housing units is so great that the poorest thirty percent of our families cannot afford to buy new housing. We observe that the cost of residential construction has been rising relative to the cost of other goods. We observe the rapid spread of the slums in the face

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6 The best works on this topic with which I am familiar are the studies by the U.S. Bureau of Labor Statistics cited in footnotes 34 and 35.

7 Schorr, Slums and Social Insecurity, p. 102.


of a widely shared increase in per capita income.\textsuperscript{10}

Some of these observations have already been proven inaccurate and others will not withstand empirical verification.\textsuperscript{11} Still other of these observations though factually correct do not indicate market failure as this term is traditionally used.\textsuperscript{12} Rather than respond directly to the numerous allegations of market failure, the question of the competitiveness of the market for housing service will be examined. To the extent that the housing market is competitive, to that extent the allegations of market failure in the traditional sense may be

\textsuperscript{10} Robert K. Brown, The Development of the Public Housing Program (Atlanta: Bureau of Business and Economic Research, School of Business Administration, Georgia State College of Business Administration, 1960), iii. This observation has been made less frequently in scholarly literature since the publication of the U.S. Census of Housing: 1960 which indicates that the percentage of total housing units which were either dilapidated or lacking one or more plumbing facility declined from 37 percent in 1950 to 18 percent in 1960. Even in the less relevant absolute terms, there was a decline from 17.0 million to 10.6 million units. U.S. Bureau of the Census, U.S. Census of Housing: 1960, Volume I, States and Small Areas, United States Summary, Final Report HC (1)-1 (U.S. Government Printing Office, 1963), xxxvi. Despite these facts the myth of the rapid spread of slums persists in popular discussion.

\textsuperscript{11} This statement is true of the first and fourth examples in the preceding paragraph. See footnote 10 and the discussion of the poor-pay-more hypothesis at the end of this section.

\textsuperscript{12} This statement is true of the second and third examples above.
dismissed. From this examination it will be concluded that the model of perfect competition is by far the best positive theory of the housing market which has been proposed and tested. The implication of the acceptance of this model for the poor-pay-more hypothesis is explained.

There appear to be two widely used ways of determining the extent of the competitiveness of a particular market. On the one hand, a set of sufficient conditions for the optimality of market organization may

13 There are clearly two housing markets. There is a demand for a supply of housing service. There is also a derived demand for and supply of housing stock. For purposes of this dissertation, only the former is relevant. Hence, the phrases "housing market" and "market for housing service" will be used synonymously here. A detailed analysis of the market for housing stock by Sherman Maisel, Housebuilding in Transition (Berkeley: University of California Press, 1953) suggests good market performance.

14 Before proceeding, I would like to direct a few remarks to an issue which bothered a number of people who have read this section. All mention of racial discrimination and segregation has been omitted from this section. How can I conclude that the market for housing service is perfectly competitive in light of the well-known discrimination against and segregation of Negroes? There are two reasons. First, if some individuals have tastes for discrimination, then perfectly competitive markets are consistent with racial discrimination and segregation. This is definitively demonstrated by Gary Becker in his The Economics of Discrimination (Chicago: University of Chicago Press, 1957). Indeed, most of Becker's analysis is based on the dual assumptions of perfectly competitive markets and the existence of tastes for discrimination. Secondly, my reading of the literature on public housing indicates that the desire to alleviate racial prejudice or its effects is not high among the reasons for which individuals have supported public housing.
be compared with the facts of the behavior of individuals in and the
structure of the particular market. On the other hand, an econometric
model of the market based on the assumptions of perfect competition may
be compared with an econometric model based on other assumptions with
respect to ability to explain indices of market price and/or quantity.
Neither of these approaches has been tried on the housing market. A
definitive piece on each of them is clearly outside the scope of this
dissertation. However, exploration of the evidence now available within
these frameworks suggests (but not compellingly) that the market for
housing service is a quite competitive market. Let us examine the evi-
dence relevant to each method.

According to Henderson and Quandt, "a perfectly competitive market
satisfies the following conditions: (1) firms produce a homogeneous
commodity, and consumers are identical from the sellers' point of view,
in that there are no advantages or disadvantages associated with selling
to a particular consumer; (2) both firms and consumers are numerous, and
the sales or purchases of each individual unit are small in relation to
the aggregate volume of transactions; (3) both firms and consumers
possess perfect information about the prevailing price and current
bids, and they take advantage of every opportunity to increase profits
and utility respectively; (4) entry into and exit from the market is
free for both firms and consumers."¹⁵

¹⁵ James M. Henderson and Richard E. Quandt, Microeconomic Theory
Before considering the evidence concerning the extent to which these sufficient conditions are met in the market for housing service, it is important to recognize that "this list of requirements of perfect competition is by no means a statement of the minimum requirements, and in fact no one is able to state the minimum requirements."\textsuperscript{16} For example, Alchian has already shown that perfect information and entrepreneurs who try to maximize profits are superfluous provided that conditions (2) and (4) hold.\textsuperscript{17} In addition, since the acquisition of information is a resource using activity, perfect information is in general inconsistent with efficient resource allocation. The further development of the concept of perfect competition will almost certainly eliminate perfect information as a sufficient condition.\textsuperscript{18} Consequently, let us confine the discussion to conditions (1), (2) and (4).


\textsuperscript{18} George Stigler, "The Economics of Information," Journal of Political Economy, LXIX (June, 1961), pp. 213-25 has made a significant contribution to the positive theory by deducing testable hypotheses from the assumption of rational individual behavior. The normative theory is yet to be developed. Because of the public good nature of knowledge, rational private behavior will probably not lead to efficient resource allocation.
The great variations among residential structures as to size, type of construction, floor space and other characteristics to which consumers attach value have led most observers to presume that a very heterogeneous good is traded in the housing market. However, at least one student of the housing market has presumed that each residential structure emits a flow of a homogeneous good called housing service and that it is this good alone to which consumers attach value. Different residential structures emit different quantities of housing service per time period. Admittedly this assumption represents a simplification of reality but a simplification on which it is possible to base a theory of the housing market which has many testable implications. Richard Muth developed this competitive theory of the housing market and tested a few of its implications.¹⁹ Without this simplifying assumption, no theory with testable implications has been rigorously developed. The assumption of a homogeneous good called housing service can only be rejected if theories of the housing market without this assumption have greater explanatory power. Hence, the assumption that a homogeneous good is bought and sold on the housing market cannot be rejected at this time. Eyesight is not a satisfactory judge of this question.

The geographical extent of the housing market is the local community whether it is a large metropolitan area or a small isolated town. Each household in a local community is a demander of housing service and each owner of housing stock is a supplier. About 66 percent of the population of the United States lived in a Standard Metropolitan Statistical Area (i.e., in a locality with a population greater than 50,000) in 1960 and this percentage is increasing. Since the average household had 3.29 members in 1960, the smallest SMSA had roughly 15,198 demanders of housing service. One demander would have to purchase a quantity of housing service with a market value of $13,070 per month or own a housing unit with a market value of $1,643,154 in order to purchase one percent of the total quantity of housing service supplied each month.

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20 To test this hypothesis one should look at the movement of prices for mutually exclusive parts of a number of local communities. We should observe that price movements within a local community are more highly correlated than between different localities.


According to the U.S. Bureau of the Census, U.S. Census of Housing: 1960 ..., xii; the median gross rent of renter-occupied non-farm units was $71 per month in 1960. This figure includes property taxes, utilities and some furniture. From the same source we know that the median value of owner-occupied non-farm units was $11,900 in 1960. This figure does not include property taxes or utilities. In "Public Housing or Income Supplements--The Economics of Housing for the Poor," Journal of the American Institute of Planners, XXXIV (March, 1968), p. 96, Eugene Smolensky estimates that the appropriate discount rate for investment in housing stock is 5% and that the economic life of the average housing unit is 40 years. Using Smolensky's estimates, the average market rent which would be obtained for a housing unit with a market value of $11,900 is given by the solution to the following equation.

$$\sum_{t=1}^{40} 12R/(1 + .05)^t = 11,900$$

The solution to this equation is $R=58$. In order to make this figure comparable with the figure for renter-occupied units, it is necessary to adjust for property taxes and utilities. Since annual residential property taxes are roughly 2 percent of the market value of the housing unit, they add $20 to the monthly cost of housing to the average owner-occupant. A lower bound estimate of the utilities expenditures of owner-occupants can be obtained by assuming that owner-occupants pay the same percentage of their rent for utilities as do renters. The median contract rent for renter-occupied non-farm units was $58 per month in 1960. This figure includes some utilities. The gross rent includes utilities for all units. Hence, the difference between gross rent and contract rent is an underestimate of the utilities consumed by the average renter household. This difference is $13 per month. The contract rent is an overestimate of the rent excluding utilities. Therefore, 22% [=13/58] is an underestimate of the ration of utility expenditures to other rent for the median renter household. Since using an underestimate for the purpose at hand biases the figures against the propositions which I am trying to establish, no attempt will be made to correct this estimate. The median owner-occupied housing unit would rent for more than $95 per month [= $78 + (.22)($78)] all bills paid. In 1960, 62 percent of all occupied units were owner-occupied and 38 percent were renter-occupied. Consequently, the market rental value of the average housing unit in 1960 was at least $86 per month [= (.38)($71) + (.62)($95)] including property tax, utilities and some furniture. In the smallest of the SMSA markets there are 15,198 demanders. Therefore, the dollar value of the housing services bought and sold each month was $1,307,000 [= ($86)(15,198)]. A renter would have to pay $13,070 per month for rent in order to purchase one percent of the quantity supplied. A owner-occupant would have to own a house with a market value of $1,644,154. In these calculations median rather than mean values have been used because they are more accessible. Since the median rent is less than the mean rent, the results are biased against the point that I am trying to establish.
higher for larger market areas. Since no evidence of collusion among
buyers has been presented, it seems reasonable to conclude that there
is no monopsony power in the market for housing service.

Some of the same data used to suggest the absence of monopsony
power may also be used to suggest the absence of monopoly power. Sixty-
two percent of households sold housing service to themselves in 1960.
Since the average rent for renter-occupied units was $71 and the average
rent of owner-occupied units was $95 per month, owner-occupants sold
69%[= (.62)($95)/(.62)($95)(.38)($71)] percent of the housing service
sold during 1960. We have already indicated that it is highly unlikely
that any of these sellers controls as much as one percent of the market.
At most, one seller could control 39 percent of the market by owning all
rental units. In the smallest SMSA market this would require the owner-
ship of housing stock with a market value of $84,432,348. This figure
would be larger for bigger markets. For example, it would be $844,323,480
in a city of 500,000.

With the exception of Grebler's detailed study of New York's Lower
East Side, there appears to be no study directed towards the size dis-
tribution of ownership of rental housing.24 In the absence of such a
study nothing more definitive can be said about the degree of concen-
tration in the selling of housing service. However, this author will
hypothesize that concentration in the market for housing service is well

24 "If concentration is defined as a tendency for identical holders
to own large numbers of parcels in the area, the records suggest that
there is no widespread concentration of private ownership at the present
time." Leo Grebler, Housing Market Behavior in a Declining Area (New York:
below average using any generally accepted measure of concentration and classification of industries. Until evidence of collusion among sellers is presented, it seems reasonable to presume that no single economic unit controls a significant portion of the market.

As in the cases of the other conditions for perfect competition, the ease of entry and exit by buyers and sellers has been largely ignored in the literature. However, a cursory examination of the data suggests great ease of entry. Between 1950 and 1960 there was a net increase of 9.2 million owner-occupied housing units.\(^{25}\) This means that there were at least 9.2 million new suppliers of housing service during this period. In addition, there was a net increase of 872,000 renter-occupied units.\(^ {26}\) Hence, there were at least 10.72 million new buyers of housing service during this period. In view of this great ease of entry and exit, it is difficult to believe that any collusive arrangement could be maintained.

The evidence just presented leads this author to presume that the market for housing service is quite competitive. However, since no acceptable over-all measure of the extent to which the conditions for perfect competition are met has been developed, there is no scientific test of this presumption. Alternative positive theories of the housing market cannot be rejected on the basis of this evidence. This result leads directly to the second method for determining the competitiveness of the housing market, namely a comparison of the explanatory power of


econometric models of alternative theories of the housing market. The model which explains the largest proportion of the variation of market price and/or quantity wins. If one econometric model has beaten all challengers at any point in time, then the corresponding theory is accepted as the appropriate theory until its economic model is beaten by an econometric model representing an alternative theory. 27

Richard Muth has already developed the positive theory of the housing market under the assumption of perfect competition. 28 Based on this theory he has constructed and estimated an econometric model of this market. Muth is able to explain between 60 and 70 percent of the variation in quantity (as measured by deflated expenditures) with just three variables—permanent income, the average cost of construction, and the interest rate. All three variables are highly significant. By expanding the simple model to include a hypothesis about expectations formation which had been successful in studying other phenomena, Muth is able to explain 85 to 95 percent of the variation in quantity with only four variables.

Unfortunately, few alternative theories of the housing market have been developed in detail. The few theories that have been proposed suffer from major theoretical defects such as a grossly non-homogeneous measure of quantity or a superabundance of special assumptions which

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27 This method is well-illustrated by the controversy between the quantity theorists and the traditional Keynesians. For example, see the September 1965 issue of the American Economic Review.

blur the distinction between theory and pure description. As yet, no attempt has been made to represent these theories as econometric models of the housing market. Until an alternative theory of the housing market is developed which leads to an econometric model that has more explanatory power than Muth's model, perfect competition is the best theory of the housing market available by this criterion.  

Having tentatively accepted perfect competition as the best existing theory of the housing market, we finally come to a consideration of the most popular and relevant current allegation of market failure — the poor-pay-more hypothesis. Before stating the hypothesis rigorously, it is necessary to reiterate one of the assumptions of the competitive theory of the housing market, namely that all housing units provide the same type of services but different housing units provide different amounts. At each point in time, each housing unit contains a certain number of units of housing stock. One unit of housing service per unit time is defined to be the flow of housing service emitted by one unit of housing stock per unit time. At any point in time, there is some market price per unit of housing service which applies to the housing service emitted by all dwelling units in the market. We observe directly neither the price nor the quantity of


30 This statement is true despite the fact that Muth's theory has faced no challenges. Muth is unable to bring his theory to a crucial test because of the absence of an alternative theory with testable implications. Nevertheless, implications of the competitive theory are not rejected by Muth's evidence.
housing service yielded by particular units. Instead we observe the rent which is equal to the price times the quantity. Nevertheless, this separation of rent into two non-observable quantities is invaluable for understanding the workings of the housing market. It allows us to separate the factors which affect the quantity of housing service emitted by a particular unit (e.g., deterioration) from the factors which affect the price per unit of housing service (e.g., an improvement in the method of constructing new housing).

Let us now interpret the poor-pay-more hypothesis in terms of this new approach. For some reason, the price of housing service is greater for housing units yielding small quantities of housing service than for units containing large quantities. This price difference is not attributable to differences in cost.\(^{31}\) As a result, owners of housing units emitting small quantities of housing service make excess profits. For some reason, the excess profits do not stimulate an increase in the supply of these small bundles of housing services, the market works effectively. The price of housing service tends towards the minimum long run average cost of production of housing service. Consequently, the price of housing service for small bundles exceeds the minimum long run average cost. As a result, the consumers of these small bundles (i.e., the poor) consume a smaller quantity of housing service than required for efficient resource allocation.

\(^{31}\) A recent study has shown that the poor do pay more for food but that this difference is fully explained by differences in cost. The poor tend to shop in small stores where the merchandising cost per unit is high. U.S. Bureau of Labor Statistics, "A Study of Prices Charged in Food Stores Located in Low and Higher Income Areas of Six Large Cities, February, 1966," June 12, 1966.
Let us now demonstrate that the poor-pay-more hypothesis is inconsistent with the assumption of a perfectly competitive housing market. Starting from a situation in which the poor do pay more, let us describe how the actions of participants in this market would remedy this situation. In other words, suppose that owners of bundles of housing service of size less than \( x \) received a higher price per unit for their product than owners of bundles of size greater than \( x \). As a result, these slum landlords are making higher profits per dollar of capital invested than other landlords.

At any point in time, there is a continuous distribution of housing units by the size of the bundle of housing service which they yield.\(^{32}\) Each owner of a housing unit is able to influence the flow of housing service from his unit by maintenance, repair, alteration and addition. If all sizes of bundles were equally profitable, then owners would typically invest in maintenance. At each point in time there will be owners who are indifferent between somewhat more maintenance with the resulting greater receipts and costs and somewhat less maintenance with lower receipts and costs. If excess profits appear for some particular size bundle, then owners of smaller bundles will find it profitable to follow a policy of high maintenance and owners of larger units will find it profitable to follow a policy of low maintenance. This will increase the supply of the profitable bundles which will drive prices and profits in this sector down. Of course, this process results in

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\(^{32}\) This distribution is closely approximated by the size distribution of rents.
short run shortages in the adjoining sectors which induce the same reaction. Eventually, there will be shortages and, hence, excess profits for bundles of a size which can be provided by new construction. New construction will continue until there are no economic profits. As applied to the poor-pay-more hypothesis, this analysis says that owners of bundles containing \( x+1 \) through \( x+n \) units will follow a low maintenance policy allowing the quantity of housing service contained in their units to fall below \( x \). The supply of units containing less than \( x \) units of housing service will increase. The price of these units will fall. Only when all size bundles are equally profitable will there be no incentive for change. The owners of large bundles follow the low maintenance policy because it is profitable. They have the same incentive to make the "ignorant" poor aware of the availability of these units. It is difficult to perceive the source of the monopoly power of the landlord. It is simply not true that tenants are "tied" to particular landlords. 33

Although the poor-pay-more-for-housing hypothesis is inconsistent with a perfectly competitive market for housing service, it is con-

sistent with the stated findings of a study by the U.S. Bureau of Labor Statistics. "In general, homes occupied by low-income families were much more likely to be of lower quality, with respect to each of the specific characteristics studied, than were those occupied by families with higher incomes even when they paid the same rent."\textsuperscript{34} Unfortunately, this finding appears to result from a presentation of the data which biases the outcome in favor of the poor-pay-more hypothesis. In order to make the data more comprehensible to the general public, households were classified into five broad rent bands and three large income bands. Using this method of presentation, it is shown that within each rent band the higher the income range the smaller the percentage of housing units with an undesirable characteristic. From this outcome, they infer that a low-income household which pays the same rent as a high-income household will generally receive lower quality (in the terms of this dissertation, a smaller quantity of) housing. Unfortunately, it is almost certainly true that within each rent band the higher the income range, the higher the average rent. This higher rent may completely explain the differences in quality. Using their data it would be easy to test the poor-pay-more hypothesis by regressing rent on the quality characteristics. Income could then be added to the regression to determine whether it adds any explanatory power. Since

the two BLS studies on food and non-food items which used a more classical experimental design and which do not suffer from the statistical fallacy of the housing study rejected the poor-pay-more hypothesis, this hypothesis must be rejected for housing based on the evidence in this section pending a revision of the BLS study.35

Social Costs of Slums

Because of the varied academic backgrounds of the writers on this subject, there is considerable variation in the meaning of the phrase "social costs of slums" in the housing literature. With few exceptions the examples of "social costs" of slum living in the literature are not justifications for collective action in the framework of Paretian welfare economics because the costs are incurred by the decision-making unit which has complete control over the quantity of housing service consumed.36 If only the consumer of substandard housing would be benefitted by an improvement in his housing, then no externality is involved. Consequently, the fact that children living in the slums are bitten by rats does not, in and of itself, justify collective

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action in the normative framework of this dissertation. In this section a brief critique of the empirical studies of the social costs of slums and their relevance to public policy will be made. This critique will be followed by a conceptual discussion of how the "social costs" which are externalities in the Paretian sense might lead individuals to demand housing service for low-income families.

Many empirical studies infer causation from housing to physical, mental and social disorders from simple correlation between two variables without appeal to theory. A popular method is to compare the incidence of physical, mental and social disorders by Census tract with the characteristics of housing in the tract. The weakness of this approach in general is too well-known to document. In the particular case of housing and juvenile delinquency, it is well-illustrated by the study of Bernard Lander. He finds that "the juvenile delinquency rate is highly correlated with substandard housing and with residential overcrowding. In the partial correlation analysis, when the influence of other variables studied is eliminated, instead of positive correlations

37 However, if individuals informed of this situation are willing to pay something to improve it out of sympathy for slum dwellers, then these costs become social of the specific type discussed in the next section.

38 Jay Rumney, "The Social Costs of Slums," The Journal of Social Issues, VII (1951), pp. 77-79, surveys the results of a number of these studies. Wilner et al, The Housing Environment and Family Life, Chapter 1 is an excellent short review of the better studies in this field.
between these variables and delinquency of \( r = +0.69 \) and +.73, we have derived coefficients of partial correlations of .0052 and .0079 as describing the real relationship between these variables and delinquency; and when adjustment is made for the curvilinearity of the data the partial correlations are reduced in both instances to .0000.\(^{39}\)

Even the studies which do not suffer from this elementary defect cannot provide positive support for public action in the normative framework of this dissertation. These studies relate the morbidity, mental health and social disorders of members of a family to the housing occupied by the family. The benefits of improving the housing occupied by a low-income family which are measured by these studies accrue to members of the family only. These are not social costs. They would be completely internalized by rational family behavior. True externalities are involved only if an increased consumption of housing service by a low-income family results in benefits to other families.

It has been suggested that improved housing for low-income families would result in better health, lesser losses from fire and greater freedom from crime by high-income families.\(^{40}\) Although the existing empirical studies of the social costs of slum living cannot provide positive support for public action, they can suggest the inappropriateness of collective action on these grounds. If these studies show that improved


\(^{40}\) Rothenberg, *Economic Evaluation of Urban Renewal*, Chapter X.
housing for low-income families has an insignificant effect on the morbidity, mental health and social disorders of the low-income families, then it seems reasonable to conclude that the improved housing for low-income families will have little effect on the comparable variables for high-income families. In fact, the few sound statistical studies come to this conclusion. Lander shows no significant relationship between housing and juvenile delinquency.\textsuperscript{41} Wilner's study suggests very small improvements (in most cases not statistically significant at the 5 percent level) in mental and physical health attributable to a very large improvement (in the neighborhood of 60 percent) in housing resulting from a move to public housing by slum dwellers.\textsuperscript{42}

The existing empirical work on the social costs of slum living is by no means definitive. In order to better direct future statistical studies to the policy relevant externalities of slum living, a few important conceptual points must be made.

First, in the case of tangible benefits to some individuals from the improved housing of others, it is not the quantity of housing service consumed by others which directly enters the preference functions of the indirectly benefitted individuals. Rather, it is their own consumption of health, fire protection and freedom from crime which the indirectly benefitted individuals value. The quantity of housing service

\textsuperscript{41} Lander, \textit{Towards an Understanding of Juvenile Delinquency.}

\textsuperscript{42} Wilner \textit{et al., The Housing Environment and Family Life.}
consumed by certain individuals may positively affect the quantity of these final goods consumed by other individuals. However, these final goods are also influenced by other factors. For example, improved housing for slum dwellers may result in better health for non-slum dwellers but so will more public health and greater private health care. Improved housing for the poor may result in less crime against the rich. However, greater police protection will also have this effect. Clearly, the quantity of housing services consumed by low-income households enters the preference functions of high-income households as one of many inputs in the production of final goods. High-income households for which this is the case will have a derived demand for housing service for low-income households.\footnote{43}

Even if the quantity of housing service consumed by low-income households does positively affect the quantity of final goods consumed by others, it does not follow that housing subsidies are justified. It is not only necessary that a derived demand exist but also that it be of sufficient magnitude so that some high-income family places a value on the consumption of an additional unit of housing service by a low-income household beyond what the low-income household would consume in the absence of collective action.

Second, it is likely that if one individual has derived demand for housing service for low-income households for some reason, then others will also have a derived demand for the same reason. That is to say, housing service to be consumed directly by a low-income family is likely to be a collective input. These derived demand curves should be added vertically to get the total derived demand for housing service for a low-income household for this reason. It is necessary that at least one person have a positive derived demand price for quantities of housing service greater than that which would be consumed by the low-income household in the absence of a subsidy in order to justify housing subsidies for this reason in the normative framework of this dissertation.

Third, the quantities of housing service consumed by low-income families have been suggested as an input in many different types of household production functions. Health, freedom from crime and lesser losses from fire were the three mentioned earlier. A high-income family may have a derived demand for housing service to be consumed by some low-income families for some of these reasons and other besides. After vertically adding the individual derived demand curves to obtain the total derived demand for each reason, the total derived demands for each reason are added vertically to obtain the total derived demand on the part of all individuals on account of all tangible reasons.

If there were no other justifications for housing subsidies to low-income families, then the total derived demand curve on account of all
tangible benefits to high-income families would be added to the private demand curve for the poor family to obtain the total demand for housing service for this low-income family. The "right" amount of housing for this family is that amount such that the demand price of an additional unit is less than the marginal cost and the demand price of the last unit is greater than or equal to the marginal cost.

To make a case for housing subsidies to low-income families on the grounds discussed in this section, it must be shown that high-income families will benefit from the consumption of housing service by low-income families beyond what the low-income families would consume in the absence of collective action. The more high-income families that can be shown to benefit, the stronger the case for housing subsidies. The more different ways in which they can be shown to benefit, the stronger the case. While these remarks may seem common sensical, all of the empirical measurements of the "social costs" of slums appear to have proceeded in ignorance of these considerations.

Paternalistic Altruism

Finally let us consider what seems to this author to be the primary motivation of active supporters of public housing, namely paternalistic altruism. To say that an individual is altruistic is not to say that he wishes to make others better off at his own expense. On the contrary, by making others better off, he also makes himself better off. He is willing to give up some goods in order to make other people happier because he prefers the added well-being of others to the goods that he
could have purchased. Consequently, if some people are altruistic, then some transfers between individuals will unambiguously increase social welfare.

To the altruistic individual, the well-being of other individuals is a good. As in the case of other goods, the quantity demanded depends on the price to, the income and tastes of the individual buyer. Consequently, the optimal amount of transfers justified by the altruism of individuals does not depend solely on the "needs" of the recipients but also on the prices to, incomes and preferences of the givers. 44

The "needs" approach is rejected by most serious students of public expenditures. The following statement is typical. "The most important use of the benefit-cost principle may well be negative. It is a useful antidote to two approaches that are widely employed and that are pretty sure to lead to poor results. The first of these is the requirements approach. It says that a country 'needs' X thousand more new housing units, W million gallons of water, Y dozen nuclear submarines, Z thousand more classrooms by 1970, and that this need is so clear that it must be fulfilled regardless of the cost. In fact, there is always some cost which that 'requirement' is not worth. And adding up the 'requirements' as seen by the proponents of each program always yields fantastically expensive results. Economic resources are scarce, tough choices have to be made between competing programs, and strong-voiced assertions about requirements and needs do not really help us make wise decisions. Benefits must be balanced against costs at the margin." Otto Eckstein, Public Finance (Englewood Cliffs, New Jersey: Prentice Hall, 1964), pp. 25-26.
Ignoring other motives for transfers, if no one in society were altruistic, then transfers in cash and in kind cannot be justified in the normative framework of this dissertation regardless of the needs of the poorer members of society.

Given that altruism justifies transfers between individuals, how can it justify a subsidy in kind such as public housing? After all, an individual can buy anything which costs $100 with $100 in cash. Consequently, it would seem that you could not make a person better off with a $100 subsidy in kind than with $100 in cash. On the other hand, a subsidy in kind costing $100 may be worth less than $100 to a particular person. One hundred dollars worth of caviar is hardly worth that amount to a poor person. Therefore, one is led to believe that a gift of $100 in cash will make the recipient better off than a gift of $100 in any other form.

In answer to the question, one can simply say that some altruistic people prefer to give $100 worth of housing services rather than $100 in cash even though they realize that the recipient would be better off with the cash than with the housing services. In this case, the subsidy-in-kind is the correct program even though the recipients would have been better off with the cash. While this situation is possible, it strikes this author as quite unlikely.

More realistically, the donors may feel that the recipients would be better off with the subsidy-in-kind than with cash even though the recipients would choose the cash instead of the housing services. This attitude on the part of the donors is commonly called paternalism. In the case of public housing, the nature of the recipients might seem to
strengthen the argument for paternalism. Their lack of education probably means not only that they are unproductive but also that they are less efficient maximizers within their very limited budget constraints. Paternalism does seem to be a major aspect of reality. Indeed, we observe that most charitable organizations give aid in kind rather than in cash. If altruistic individuals are also paternalistic, then the transfer programs should reflect this fact. If this paternalistic altruism involves a desire for low-income families to consume more housing service, then we may properly say that these altruists have a demand for housing service for low-income families.

The paternalistic altruism which motivates individuals to give to charitable organizations might be somewhat different from that which justifies collective action. If the individuals who give to charities valued only the increased consumption of the particular good by the recipients regardless of the source of this increase, then they would typically have no incentive to give to charitable organizations for the same reason that we are led to believe that very little defense would be provided if defense were financed by voluntary contributions. The point is that the value that each paternalistic altruist places on a one unit increase in the consumption of the good by the recipient is small relative to the resource cost of providing an additional unit. Consequently even though the paternalistic altruist values the increased consumption by the recipients, he typically has no incentive to help them unilaterally. And yet many people do give to charitable institutions. This could be explained by a very large demand for these activities on the part of donors. This could also be an example of "irrational" behavior. Alternatively it might be suggested that individuals who give to charitable institutions are not interested in the increased consumption of some good by the recipient in general but only in the increased consumption attributable to their own donation. In the extreme case, this kind of paternalistic altruist places no value on the increased welfare of the recipient from other sources. Collective action is not necessary to satisfy this motivation. The good involved is completely private.
Since there are many people who place some value on the increased consumption of housing service by low-income families, it is a collective good. Consequently, we cannot count on individualistic action operating through the market to produce the correct amount of housing service for low-income families. The demand curves of paternalistic altruists should be added vertically to the demand curves stemming from tangible benefits and to the private demand curve of the low-income household to obtain the total demand for housing service to be consumed by the low-income household.
Chapter III

A NORMATIVE THEORY OF SUBSIDIES IN KIND

Chapter I outlined a normative theory of transfers in which transfers in cash and in kind are necessary for efficient resource allocation even though the existing distribution of ownership of productive factors is accepted as a constraint because there appear to be activities which individuals value that require transfers between individuals. If individuals other than the recipients of the transfers do not value these activities, then transfers cannot be justified in a Paretian welfare economic framework.

The discussion of the justifications for housing subsidies to low-income households in Chapter II suggests that the transfer payments involved in a program of housing subsidies to low-income households rest on at least two well-known, specific motives of some individuals in our society. First, housing service for low-income households enters many preference functions as one among many inputs in the output of several final consumer goods. Hence, some individuals will have a derived demand for housing service for low-income households. Second, housing service for low-income households enters directly in the preference functions of some paternalistic altruists. These individuals have a direct demand for housing service for low-income households.

In this chapter, the supply and demand curves for the transfer activities are drawn. The optimal total output, distribution of output, and pattern of transfers is exhibited. Based on the general assumptions
of the normative theory presented in this dissertation and on some plausible special assumptions explicitly introduced, some propositions in normative distribution theory and some corollaries for the theory of economic policy are proven. The conclusions of these theorems are familiar but weaker than their typical statement in the literature. The assumptions and reasoning necessary to derive these conclusions are new.

Before beginning the analysis, it should be clearly understood that the results of the analysis are quite general. The transfer activity could be educational services as well as housing services. The motive for collective action could be a taste for equality of opportunity as well as a taste for paternalistic altruism. Within the general normative framework of this dissertation, the model presented in this chapter would seem to be the general model appropriate for all subsidies in kind. Consequently, the general results of this analysis would seem to be as applicable to public education, medicare, food stamps, etc. as to public housing.

Description of the Model

Let us now focus on the housing market. To simplify the diagrammatic presentation of this model, let us assume that society is composed of two individuals, A and B. Suppose that A has a small and B has a large initial endowment of productive factors. Assuming that the allocation of all other goods is Pareto optimal, then the demand for and supply of housing service might be described by Figure 2. $D_A (X_A)$
is A's demand for housing service for himself. \( D_B (X_A) \) is B's demand for housing service for A for whatever reasons. Since housing service for A is a collective good, the two demand curves are added vertically to obtain \( D (X_A) \), the total demand for housing service for A. In symbols, \( D (X_A) = D_A (X_A) + D_B (X_A) \). Likewise, \( D (X_B) = D_A (X_B) + D_B (X_B) \).

Since housing service for A and B are the same good in production, the two total demand curves are added horizontally to obtain the total demand for housing service. In symbols, \( D^{-1} (X) = D^{-1} (X_A) + D^{-1} (X_B) \).

In the case depicted, reciprocal externalities are present.\(^1\)

A's welfare depends on the quantity of housing service consumed by B, and B's welfare depends on the quantity consumed by A. However, the dependence of A's welfare on B's consumption of housing service is Pareto irrelevant.\(^2\) That is to say that no increase in the quantity of housing service consumed by B beyond what B would consume in the absence of collective action adds to A's welfare. No collective action is justified by the existence of this externality. B is already consuming the optimal of housing service. On the other hand, the dependence of B's welfare on A's consumption of housing service is Pareto relevant. Consequently, collective or voluntary co-operative action may make some people better.

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\(^2\) We are indebted to James M. Buchanan and William Craig Stubblebine, "Externality," Economica, XXIX (November, 1962), pp. 371-84 for the crucial distinction between Pareto relevant and irrelevant externalities.
off without making anyone worse off. ³

In the case depicted by Figure 2, the optimal quantity of housing service is 0c of which 0a goes to A and 0b goes to B. In the absence of collective or voluntary co-operative action, A would consume 0d(0a) and B would consume 0b. ⁴ Hence, Pareto optimality requires the extension of A's consumption of housing service from 0d to 0a. Referring to Figure 3, an enlargement of Figure 2 (a), we see that A's marginal evaluation of housing service for himself is 0h(=ae) and that B's marginal evaluation of housing service for A is 0i(=ak) both evaluated at output 0a. Under the rule of benefit taxation, A should pay 0aeh and B should pay Oaki(=hefg) of the total cost Oafg(=Oaeh + hefg) of the 0a units of housing service for A. Loosely speaking, Oaki is transferred from B to A in the form of housing service. ⁵

Some Propositions in Normative Distribution Theory

Chapter I contains the general assumptions of the normative theory of this dissertation. However, it is impossible to fully evaluate this normative theory by examining these fundamental assumptions only. It

³ The word "may" is used advisedly. The decision-making costs of collective and voluntary co-operative action may be so large that it is better to allow the externality to remain. See, Buchanan and Tullock, *Calculus of Consent*, Chapter 5.

⁴ Actually, B would consume somewhat more housing service because he would have one less item of expenditure, the housing of A.

⁵ This statement is rigorously correct only if the price elasticity of A's demand for housing service for himself is unitary. Otherwise, as a result of the transfer, A will spend either more or less money on other goods. More rigorously, we could say that B should be taxed Oaki dollars which should be given to A provided that he consumes 0a units of housing service (or spends Oafg dollars on housing service).
is also essential to consider the implications of the assumptions because they add significantly to our understanding of the theory. In this section, three theorems concerning how the size of the optimal transfer varies with the wealth of the recipient, the wealth of the giver, and the cost of the production of the activity are proven for the class of models described in the preceding section. These theorems have some obvious corollaries for the theory of economic policy. The conclusions of these theorems and corollaries are far from novel. Indeed, strong versions of these conclusions are scattered throughout the literature on social policy. However, until now these theorems and corollaries have lacked axiomatic foundations, specific assumptions and proofs.

The normative axiom of this dissertation may be stated simply. The institutions of society should be designed to produce the one pattern of resource allocation which is Pareto optimal given the preference functions of all individuals, their initial endowments of productive factors, the specified pricing rules, and the existing technology. By the definition of Pareto optimality, if the institutions are designed as prescribed, then it is impossible to make any person better off in terms of his own preferences without making someone worse off in terms of his preferences. To put the matter

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7 For an amendment of this axiom to account for the inevitable decision-making costs of collective action, see footnote 1 of Chapter II.
another way, we will never remain in a position where it is possible to make some people better off without making anyone worse off. Let us now proceed to establish some of the less obvious properties of this normative theory.

To simplify the analysis, let us assume that society is composed of two individuals (i.e., the recipient of the transfer and the giver), that housing service for the recipient is the only transfer activity, and that the production of all activities is characterized by constant returns to scale. Although simple algebraic proofs are possible, the geometric method is used because it is more enlightening.

THEOREM 1. If the quantity of the transfer activity demanded by the recipient varies directly with is permanent income, if the quantity of the transfer activity demanded by the giver varies inversely with the price of the transfer activity to him, and if the giver places no value on an additional unit of the transfer activity beyond some quantity; then the optimal quantity of the transfer activity increases with increases in the recipient's income, but the size of the optimal subsidy from the giver to the recipient varies inversely with the recipient's permanent income only after the recipient's income has exceeded a certain amount.

PROOF. Let us denote the recipient of the transfer by A and the giver by B. In Figure 4, \( D_A \) is the private demand for housing service by A. \( D_B \) is the demand for housing service for A by B. \( D \) is the total demand for housing service for A. Suppose that A's permanent income
rises. As a result, A's demand curve for housing service shifts upward from $D_A$ to $D'_A$. Since B's permanent income, tastes and the prices that he pays for other goods remain the same, his demand curve for housing service to be consumed by A remains the same. Consequently, the total demand for housing service for A shifts upward from D to D'. The optimal quantity of housing service consumed by A necessarily increases from 0a to 0b. We expect that A should receive a smaller subsidy as he becomes more wealthy. Under our assumptions, this is not necessarily the case. The optimal subsidy is equal to the area of the rectangle under $D_B$ bounded by the optimal quantity of housing service for A. If 0a is the optimal quantity, then Oade is the optimal subsidy. If 0b is the optimal quantity, then Obcf is the optimal subsidy. Hence, if $D_B$ is price elastic in the range of the change in optimal output, then the optimal subsidy will increase with A's wealth. However, under the plausible assumption that B does not care about further housing service for A beyond some point (i.e., the $D_B$ curve intersects the quantity axis),

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8 Although in this formulation a change in the recipient's wealth does not result in a shift in the giver's demand curve, it does result in a change in the value which the giver places on an additional unit of housing service for the recipient beyond what the recipient would consume in the absence of collective action. This framework makes it possible to analyze the effects of changes in the wealth of individuals and the technology available to society separately from the effects of changes in tastes for transfer activities.

9 In this framework, the only justification for a national minimum independent of the wealth of the recipient is a perfectly inelastic demand for the transfer activity on the part of the giver. In the many person case, the giver would have to have the same demand for the transfer activity to be consumed by each recipient.
the lower range of $D_B$ will be price inelastic. Even if the optimal subsidy does increase with increases in A's wealth initially, eventually it will decline continuously with A's wealth and reach zero at output Oh.

Let us examine the special assumptions of Theorem 1. Statistical studies suggest that the private demand for most goods has a positive income elasticity. In the case of housing service, this assumption is strongly supported by Muth's econometric study. The second assumption says merely that housing service for low-income households has the same general property as most goods consumed by the giver: the higher its price, the lower the quantity demanded. The third assumption says that the giver does not care about the housing of the recipient beyond some amount (e.g., the amount that the giver himself consumes). Although these last two assumptions have yet to be tested for particular transfer activities, they seem to be much weaker and considerably more plausible than assumptions typically used to evaluate the distributional effects of government policy and, hence, form a firmer foundation for the development of a normative theory of transfers.

The conclusion of Theorem 1 is weaker than the comparable statement in the literature where it is regarded as self-evident that the size of the optimal subsidy from the giver to the recipient in all circumstances varies inversely with the recipient's permanent income. In more familiar terms, if a low-income household becomes less "needy,"

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10 Richard Muth, "The Demand for Non-Farm Housing," p. 58. Muth finds an income elasticity of private demand for housing service near one. His data would certainly reject the null hypothesis of zero income elasticity with very high probability.
then we should help it less. By the same token, if we are equally altruistic towards two other families and one of these families is poorer than the other, then we should give a larger transfer payment to the poorer family. In the normative theory of this dissertation, it is clear that a particular society may never have been, may not now be, and may not in the near future be in a situation in which a large percentage of the recipients of transfer payments have sufficiently high permanent incomes in order that the strong version of the conclusion hold. Although the unqualified version of the conclusion of Theorem 1 could itself be considered an axiom of a normative theory (but not one with the axioms of Paretian welfare economics), the more fruitful approach would seem to be to begin the analysis at the stage of individual preference functions.

**THEOREM 2.** If the quantity of the transfer activity demanded by the recipient varies inversely with the price of this activity to him, if the quantity of the transfer activity demanded by the giver varies directly with his permanent income, and if the externality is Pareto relevant; then both the optimal quantity and the size of the optimal subsidy vary directly with the permanent income of the giver.

**PROOF.** If the dependence of B's welfare on A's consumption of housing service is not Pareto relevant, then the optimal subsidy is zero and will remain zero until increases in the giver's income make the externality Pareto relevant.

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11 An individual is equally altruistic towards two other individuals if and only if he has the same altruistic demand for the transfer activity for both of them. This definition has the minimum desirable property. If the two recipients have the same tastes and face the same economic situation (i.e., prices and income), then the altruist would give them the same help.
In Figure 5, suppose that B's permanent income rises. As a result, B's demand curve for housing service for A shifts upward from $D_B$ to $D'_B$. Since the tastes and income of A and the prices of other goods to A are unchanged, $D_A$ remains the same. Consequently, the total demand for housing service for A will increase from D to $D'$, and the optimal quantity of housing service for A will increase. In Figure 5, the increase is from 0a to Ob. Since we have assumed that A's marginal evaluation of housing service falls as the quantity he consumes increases, the price per unit of housing service paid by A falls as a result of the increases in B's wealth. \(^{12}\) In Figure 5, A's marginal evaluation falls from 0f to 0e. By the assumption of constant returns to scale for all activities, the average (and marginal) cost of an additional unit of housing service remains unchanged. Consequently, the price per unit of housing service for A paid by B increases from fg(=0c) to eg(=0d). Since both the optimal quantity and the price of the activity to B increase as a result of his greater permanent income, the optimal subsidy necessarily varies directly with B's permanent income. In Figure 5, the optimal subsidy increases from Oahc to Obkd.

The comments appropriate for the special assumptions of Theorem 2 are analogous to the comments already made concerning the special assumptions of Theorem 1. Statistical studies suggest that the private demand for most goods has a negative price elasticity. In the case of housing service, this assumption is strongly supported by Muth's

\(^{12}\) This statement naturally depends on our axiomatic assumption of benefit taxation.
econometric study. The second assumption merely says that housing service for low-income households has the same general property as most goods consumed by the giver: the greater his income, the greater the quantity demanded. The third assumption says that the externality is of sufficient magnitude to make collective action potentially beneficial.

Unlike the conclusion of Theorem 1, the conclusion of this theorem is as strong as comparable statements in the literature. It corresponds to the familiar statement that if the rich get richer while the poor stay poor, then more should be transferred from the rich to the poor. As a theorem in positive economics, it would suggest that totally disabled individuals will receive greater transfer payments in a rich country than in a poor country and within any country will receive greater transfer payments as the per capita income of the country increases. This normative theorem is also consistent with the familiar statement that the richer individual should pay more taxes for transfer programs provided that the taste for transfers does not systematically decline with increasing income.

As already mentioned, the literature on social policy contains many statements resembling the conclusions of Theorems 1 and 2.

13 Muth, "The Demand for Non-Farming Housing," p. 58. Muth finds a price elasticity of private demand for housing service near minus one. His data would certainly reject the null hypothesis of zero price elasticity with high probability.
Some of these statements are much stronger than the examples already given and represent a mixture of the conclusions to Theorems 1 and 2. To paraphrase a typical statement, a wealthy country should do more for its poor than a less wealthy country. Translating this statement into the terms of this chapter, it reads "the greater the per capita wealth of a country, the greater the amount of the optimal subsidies per subsidized individual (ceteris paribus)." It should be clear from the proofs of Theorems 1 and 2 that, within the framework of the normative theory of this dissertation, this conclusion can only be reached with the strongest of assumptions. Basically, there are two sometimes opposing forces affecting the optimal subsidy. In real societies greater per capita wealth is associated with greater per capita wealth for the average person at each different level of wealth. In short, both the recipient and the giver share in the greater wealth. By Theorem 2, as the wealth of the giver rises, the optimal subsidy rises. However, by Theorem 1, as the wealth of the recipient rises, the size of the optimal subsidy may fall. From an examination of the

14 Although the following two quotations are grammatically descriptive, their substance is clearly normative and their intention persuasive. "In times of stress, welfare activities supported by such a subsidy cash make an easy target for economy marksmen who specialize in cancelling out welfare appropriations. Too often, the taxpayer's feeling for his fellowmen is lost in the seams of his purse." Charles Abrams, "The Subsidy and Housing," The Journal of Land & Public Utility Economics, XXII (May, 1946), pp. 134-35. Abrams is saying that the optimal transfer does not decrease with a decrease in per capita. "In a time when the boon of prosperity is more general the taste of poverty is more bitter." M. Orshansky, "Counting the Poor: Another Look at the Poverty Profile," Social Security Bulletin, XXVIII (January, 1965), p. 3. Orshansky's statement may be translated to read, the optimal transfer increases with increases in per capita income.
assumptions of these two theorems, it is apparent that the change in
the optimal subsidy resulting from a change in per capita wealth depends
on the price and income elasticities of the social and private demands
for the transfer activity and on the distribution of the increase in
per capita income. In the absence of knowledge of these magnitudes
or of an explicit alternative normative theory, the inadequacy of the
paraphrased statement is obvious.

THEOREM 3. If the quantity of the transfer activity demanded by
the recipient varies inversely with the price of the transfer activity
to him, if the quantity of the transfer activity demanded by the giver
varies inversely with the price of the transfer activity to him, and
if the giver places no value on an additional unit of transfer activity
beyond some quantity; then the optimal quantity increases as the cost
of production of the transfer activity decreases but the size of the
optimal transfer from the giver to the recipient varies directly with
the cost of production of the transfer activity only after the cost of
production has fallen below a certain amount.

PROOF. Since both $D_A$ and $D_B$ are downward sloping, $D$ is downward
sloping. If the cost of production falls, then the optimal quantity
of housing service for A necessarily rises. From this point, the
proof of Theorem 3 follows the proof of Theorem 1 exactly and to the
same conclusion. Although initially the optimal subsidy may rise as
the cost of production falls, eventually the optimal subsidy will decline
with decreases in the cost of production. In Figure 6, the cost of production has fallen from $0f$ to $0e$. As a result, the optimal quantity of housing service for $A$ increases from $0a$ to $0b$. The optimal subsidy changes from $0agd$ to $0bhc$. In this particular case, the optimal transfer declines with the fall in price because we happen to be on the inelastic portion of the social demand curve.

Theorem 3 has an interesting implication for the theory of economic policy. To begin with, it should be noted that the average cost of production of a transfer in kind activity exceeds the average cost of production of the good involved by the administrative costs of collective action. The first implication concerns the oft-noted rapid increase in administrative efficiency during the early years of a new government program.\(^\text{15}\) It has been suggested that this fact argues for beginning programs small and enlarging them as administrative efficiency increases. As the proof of Theorem 3 indicates, if the administrative costs are higher in the earlier years, then the optimal quantity of the transfer activity is lower in the early years. However, it does not follow that the optimal appropriation (=subsidy) for the program should be smaller in the early years. This depends on the shape and position of the social demand for the transfer activity about which we have no evidence. Clearly, it is important to distinguish between these two different meanings of size.

\(^{15}\) Or, as the matter is put by opponents of the program, the great administrative inefficiencies of the early years.
The analysis of this chapter prompts two observations. First, the implications of the normative theory of this dissertation for what ought to occur as a result of certain changes in underlying factors is not unrelated to what we observe. Despite the fact that the political system is an imperfect reflector of individual preferences constrained by individual budgets, it is a reflector because, as long as the political institutions of society prevent efficient resource allocation, individuals have an incentive to agree to a change in these institutions and do so.\(^{16}\) Second, it is important to distinguish between the effects of changes in underlying variables on the desirable quantity of the transfer activity on the one hand and on the desirable dollar amount of the public subsidy, on the other hand. In the model of this chapter, the effect on optimal quantity is much less ambiguous than the effect on optimal subsidy.

\(^{16}\) By analogy, a market economy with monopolistic elements does not reflect consumer and resource owner preference for private goods. Nevertheless, if the demand for the product of a monopolistic industry increases, then (in most cases) the quantity supplied increases.
Chapter IV

OF PUBLIC HOUSING

As yet, little has been said specifically about the existing program of housing subsidies to low-income families. In this chapter, the normative theory of transfers, the positive theory of the housing market, and some relevant numbers are used to demonstrate the extent of the inefficiency of the present public housing program compared with the rent certificate plan to be proposed in Chapter V.

Public versus Private Production

The PHA produces housing service. It uses buildings constructed by private enterprise as inputs. However, the PHA specifies the characteristics of the buildings, their locations, and the amount and type of maintenance and repair to be undertaken. It hires and fires project managers and other personnel. In short, the PHA performs the same functions as private individuals who own rental housing. The private sector produces a stock of housing for the PHA, but the PHA produces the housing service consumed by its tenants. Theoretical considerations and empirical evidence to be presented in this section strongly suggest that the PHA has been quite inefficient as a producer of housing service as compared to private enterprise.

Conceptually, the means of determining the relative efficiency of public and private production is straightforward. Sell each resident

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In this chapter, the PHA is a shorthand expression for the personnel of the Public Housing Administration and the local public housing authorities and the legislative constraints under which they operate.
of public housing a rent certificate with a face value equal to the resource cost of the housing service which flows from the housing unit which the resident occupies. Charge the resident the same amount for the rent certificate that he would pay for his public housing unit under the existing rent schedule. The rent certificate can be used to purchase housing service from either the PHA or private entrepreneurs and can be redeemed by these sellers of housing service at its face value from the PHA. Instruct each manager of a public housing project to set rents and follow a maintenance policy so as to maximize the total net revenue of the project.\textsuperscript{2} Let anyone willing to pay this rent live in public housing. The difference between the revenue and resource cost of public housing measures the efficiency of \textit{actual} public production compared with \textit{actual} private production.

I hypothesize that should this experiment be conducted for all existing public housing projects (or a random sample thereof) the difference between revenues and costs would be significantly negative.\textsuperscript{3} There are several a priori reasons to expect this result. Public housing is newly constructed in developed slum areas. New construction in slum areas is extremely expensive for at least three reasons. First, slum areas are typically near the center of the city. This locational

\textsuperscript{2} By net revenue, I mean the difference between total receipts and operating costs including maintenance but excluding all costs incurred prior to the beginning of this experiment.

\textsuperscript{3} This experiment is perfectly feasible for existing projects. To implement it would unambiguously increase social welfare because no one would be made worse off and some would be made better off. However, as will be demonstrated in the next section, this change will not eliminate all of the inefficiencies in the existing program.
advantage adds to the value of the land. Second, and considerably more important, in order to use developed slum land for new construction, the existing structures on the property must be torn down. These structures are capable of yielding some stream of services. The present value of this stream is a real resource cost of converting the land to this new use. Finally, there is the cost of demolition. Consequently, in order to justify this new use for the land, the new users must place a high value on central location. In the private, profit-oriented sector we observe that old structures near the center of town are replaced by commercial and high-rise, high-rent apartment buildings. We do not observe many middle income rental housing units being built in deteriorating downtown areas because these users do not place a high enough value on central location. In short, the PHA has been inefficient as a producer of housing service partly because it has made inappropriate choices of location for projects with the physical amenities of public housing.\textsuperscript{4,5}

\textsuperscript{4} Between January 1950 and June 1959, the PHA built 1564 projects with 162,545 housing units on non-slum land. The acquisition cost of this land was $0.091 per square foot and $350 per public housing unit constructed. In this same period the PHA built 293 projects with 93,492 housing units on slum land. The acquisition cost of this land (including the value of the assets on the land) was $1,116 per square foot which is 12 times the cost of non-slum land. The cost of this slum land added $1945 to the total cost of each public housing unit. If public housing tenants were indifferent between slum and non-slum locations and neighborhoods, then $1595 [=\$1945-\$350] would be the average waste per public housing unit constructed on slum land attributable to poor locational choice. This situation seems to be getting worse. During 1960 the PHA obtained final title to non-slum sites for 190 projects in order to construct 12,921 public housing units. The acquisition cost of this land was $0.10 per square foot and $589 per public housing unit to be constructed. The PHA
also obtained title to slum sites for 37 projects in order to construct 12,054 public housing units. The acquisition cost of this land was $2.21 per square foot and $2285 per public housing unit to be constructed.

Both the proportion of public housing units constructed on slum sites and the relative cost of slum land acquired has risen. U.S. Housing and Home Finance Agency, Annual Report 1960, pp. 215-16. These aggregate figures undoubtedly result in an upward bias in the estimate of waste of public production of housing service attributable to the poor location of projects because it is undoubtedly true that relatively more public housing units are built on slum land in large cities where the cost of land is high than on slum land in small cities where the cost of land is low. More accurate estimates of waste from this source could be obtained by making the estimates city by city.

If this estimate of the waste attributable to poor location is reasonably accurate, then poor location explains very little of the total waste of public production of housing service. Later in this section the total waste attributable to public production is estimated to be $28.45 per month per public housing unit. This estimate is independent of any particular explanations of the waste. At the time of construction of the public housing project, the present value of this waste over the economic life of the public housing unit was $5858

$$40 = \sum_{t=1}^{\infty} \left( \frac{28.45}{1.05} \right)^t.$$ The conversion of a flow value to a stock value has been made in order to compare the stock value of the total waste of public production to the stock value of the waste of public production attributable to poor location. Between January 1950 and June 1959, the waste of public production which has been attributed to poor location is $1595 per public housing unit actually located in slums. During this period 36.5% of public housing units were constructed in slums. Consequently, the waste attributable to poor location is roughly $582 = \frac{1}{1.365} \times \frac{1595}{1.365}$ per public housing unit constructed. Therefore, I am only able to explain 10% [=582/$5858] of the total waste of public production of housing service by poor locational choice and I have no other explanation for this very significant amount of waste.

These locational choices have often been forced on the local public housing authorities by local governments. However, this political pressure seems to be a reaction to another feature of the public housing program, namely the aggregation of large numbers of low-income families in projects. See Martin Meyerson and Edward C. Banfield, Politics, Planning, and the Public Interest (Glencoe, Illinois: The Free Press, 1955). A rent certificate plan automatically eliminates this difficulty.
Fortunately, the argument need not end with a theoretical analysis. James Prescott has suggested a method for estimating the market value of the stream of services emitted by the average public housing unit.\(^6\) Eugene Smolensky has already estimated the cost of the resources actually used to produce the flow of services emitted by the average public housing unit.\(^7\) The excess of the resource cost over the market value is the waste of public production of housing service.

Smolensky has already made one estimate of waste based on Prescott's estimate of the market value of the services yielded by the average housing unit in only 6 of over 4,000 public housing projects. Prescott estimated that the average public housing unit would rent for $87 per month on the private market. Smolensky estimated that a resource cost of $109 per month was actually incurred to produce this stream of housing service. Hence, Smolensky's estimate of waste is $22 per housing unit per month which is 20 percent of the resource cost.

In the appendix to this chapter, a refinement of Smolensky's cost estimate results in a new estimate of $103.45. The downward effect of this refinement on the estimate of waste is more than offset by the upward effect of the application of Prescott's method to data for all

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\(^7\) Eugene Smolensky, "Public Housing or Income Supplements--The Economics of Housing for the Poor," *Journal of the American Institute of Planners*, XXXIV (March, 1968), pp. 94-101.
public housing units which results in a much smaller estimate of the market value of the average public housing unit. The net effect of these two refinements is a larger estimate of waste.

Prescott's method is based on two facts. First, public housing tenants pay one-fifth of their income for rent. Second, the PHA requires that the upper income limit for entrance into public housing be set so that a public housing tenant with an income of this amount would pay a rent 20 percent less than the rent currently being paid in the community for housing comparable to his public housing unit. If these requirements are adhered to, then it follows that housing units in the private market comparable to the average public housing unit rent for an amount equal to one-fourth of the upper income limit for entrance into public housing. In 1965, the median upper income limit for entrance was roughly $3600 per year.\(^8\) Hence, the average

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\(^8\) The Public Housing Administration stopped publishing this useful piece of information in their annual report in 1962. The limits for earlier years were $2500 in 1953, $2600 in 1954, $2600 in 1955, $2700 in 1956, $2800 in 1957, $2900 in 1958, $3000 in 1959, $3100 in 1960 and $3200 in 1961. U.S. Housing and Home Finance Agency, Annual Reports, Part IV, Public Housing Administration, 1953-1961. A reasonable guess about the limit at the end of 1965 is $3600. It might also be noted that if the market is perfectly competitive and if the local authorities set the upper income limit as specified by the federal agency, then the upper income limit should rise in proportion to the cost of construction of multi-family dwellings. Between 1955 and 1960, the income limit for entrance rose by 19 percent. During this same period the Bocek index of the cost of construction of apartments, hotels and office buildings rose by 16 percent giving rough confirmation of the two assumptions. Between 1960 and 1965, the Bocek index rose by 13 percent. It seems reasonable to expect the income limit to rise by about this percentage from $3100 in 1960 to $3500 in 1965. The guess of $3600 is accepted to bias the data against my contention of substantial waste.
public housing unit emitted a flow of services valued by the market at $75 \left[=\frac{1}{12}\left(\frac{1}{4}\right)\left(\frac{\$3600}{12}\right)\right]\text{ per month in 1965.}\footnote{To say that the market value of the average public housing unit is $75 per month is not to say that its occupant (if he were allowed to purchase an $75 rent certificate for the same rent that he pays in public housing) places this value on it. Since the average public housing unit is available to only a few (i.e., the families at the head of the waiting list), the occupant of this unit typically places a lower value on this unit than the person who is willing to pay the most for it. An occupant of public housing is given only one alternative to his situation prior to public housing, namely a particular housing unit at a particular rent. This phenomenon is an additional source of inefficiency which I am unable to measure. Under a rent certificate plan, each recipient will be able to choose among the large number of housing units renting for the face value of his certificate. This property of the rent certificate plan is highly desirable because it eliminates yet another source of inefficiency.} Consequently, public production involved a waste of $28.45 \left[=\$103.45-\$75.00\right]\text{ per month per unit in 1965. To put matters succinctly, the PHA has converted $1 into 72{\%}\text{ worth of housing service. It would have been possible to help 35 per- cent more equally eligible families with the same total expenditure.}\footnote{Through a rent certificate program, it would have been possible to provide the average public housing tenant with housing comparable to his public housing unit for a resource cost including administration of $80.79 \left[=\$109.24-\$28.45\right]\text{ per month. Hence with the $10,924 used to house 100 eligible families under the present program it would be possible to house 135 \left[=\frac{10,924}{80.79}\right]\text{ equally eligible families equally well with a rent certificate program.}}\right. 

By the end of 1965, there were about 600,000 occupied public housing units.\footnote{U.S. Department of Housing and Urban Development, \textit{Housing Statistics}, July, 1966, p. 56.} Therefore, the total waste of public production of housing
service in 1965 was $204,840,000 [=(28.45)(12)(600,000)] . This is the value of the resources which could have been saved by technical efficiency in the production of housing service on the part of the PHA without changing the quantity of housing service consumed by any eligible family. This waste has been incurred during each year of the program but was smaller in the earlier years when there were fewer public housing units. This and subsequent estimates of waste should be compared with the annual resource cost of the program of $786,528,000 in 1965. 12

Individuals care about means as well as ends. It might be argued that taxpayers have such a strong preference for public over private production of housing service for low-income households that they are willing to incur the large extra cost of public production. However, the evidence available is strongly to the contrary. The public housing program has been consistently embattled since its inception and on several occasions almost terminated because of opposition to its means (i.e., public production). These means no longer have great support from the most vocal advocates of a program to improve the housing of low-income families. 13 As a result of the opposition to public production of housing service and the high cost of providing "standard"

12 See Table 3 of the appendix to this chapter. This figure includes administrative costs.

13 For support of these two observations, see Smolensky, "Public Housing or Income Supplements," p. 94 and his references; Catherine Bauer et al., "The Dreary Deadlock of Public Housing--How to Break It," Architectural Forum (June, 1957), pp. 139-41 and 218-22; and Robert K. Brown, The Development of the Public Housing Program in the United States (Atlanta: Bureau of Business and Economic Research, School of Business Administration, Georgia State College of Business Administration, 1960).
housing for low-income families by this means, the Housing and Urban Development Act of 1965 (Public Law 89-117) contains two alternatives to the existing method of providing housing services to low-income households. Section 101 authorizes the Housing and Home Finance Administrator to make rent supplement payments to non-profit, co-operative, or limited dividend owners of newly constructed or substantially rehabilitated housing in behalf of low-income families. Of much more importance, Section 103 directs each public housing agency to provide low rent housing in private accommodations to the maximum extent possible where such accommodations can be provided at a cost equal to or less than housing in projects assisted under other provisions of the United States Housing Act of 1937 as amended. This program resembles the rent certificate plan proposed in Chapter V. Besides these changes in the public housing program itself, recently inaugurated government programs (e.g., food stamps and medicare) apparently justified by much the same motives have avoided public production of the goods and relied on certificate type plans. The evidence does not seem to support the proposition that there is a strong preference for public over private production in this case.

Public production of housing service is not necessary for conducting a program of housing subsidies to low-income families. In the case of public housing, public production has proven to be extremely inefficient. The rent certificate plan, which does not involve public production, eliminates this important source of inefficiency. Conse-
sequently, the implementation of the rent certificate plan would allow greater goal achievement for each dollar spent than the existing public housing program.

Pattern of Subsidies

There are several features of the existing pattern of subsidies which are almost certainly sources of inefficiency. One is that very few of the individuals eligible for public housing have been housed by this program.14 Long waiting lists have been characteristic of the program.15 Many undoubtedly have been discouraged from applying by the length of the list. Vacancies are filled on a first-come first-serve basis. The people who do occupy public housing units receive a quantity of housing service only somewhat less than the amount consumed by the average person in the country.16 The majority of equally eligible families receive nothing.

14 According to Prescott, "The Economics of Public Housing: A Normative Analysis," p. 120; about 28 percent of the population was eligible for public housing by the income criterion in 1960 but only 7 percent of these people (i.e., 2 percent of the total population) lived in public housing units.

15 There were approximately 600,000 occupied public housing units at the end of 1965. "Existing public housing programs are not adequate, however, to provide for the half million families on the public housing waiting lists." U.S. Department of Housing and Urban Development, Annual Report 1965, p. 7.

16 In footnote 23 of Chapter II, I estimated that the average housing unit emitted a flow of housing service with a market value of $86 per month in 1960. Inflating this figure by the change in the Department of Commerce composite cost of construction index, we infer that this unit would have rented for $97 per month in 1965. In the first section of this chapter, I estimated that the average public housing unit would have rented for $75 per month on the private market in 1965.
It is possible that the parties receiving indirect benefits from housing subsidies prefer both to set up criteria which designate a group of families to be eligible for the same quantity of housing service at the same price and also to allow some of these families to receive large subsidies while the rest receive nothing. However, this seems to be a particularly unreasonable assumption.

Let us more plausibly assume that if two families are eligible for the same housing at the same rent and if both are willing to accept, then both should actually receive this subsidy. The inefficiency of the existing public housing program from this source can be well illustrated with the aid of Figure 7. For simplicity assume that the two eligible families have identical tastes and incomes and that the social demand for housing service for these two families is the same. \( D_A \) is the private demand for housing service by one of these eligible families. \( D \) is the total (=private + social) demand for housing service for this family. If \( O_A \) is the price of housing service, then efficient resource allocation requires that each of the two families consume \( O_c \) units of housing service.\(^{17}\) In the absence of collective action, each eligible family would have consumed \( O_b \) units. If the optimal collective action is taken for each family, then there is a gain in social welfare which can be measured by twice the area \( \\text{igj} \), the increase in consumers' surplus.\(^{18}\)

\(^{17}\) The administrative costs of the transfer program are ignored.

\(^{18}\) This is not rigorously true unless the amount of money spent on these goods is the same before and after collective action. If there is a change, then there will be changes in surplus in other markets. Fortunately, the changes proposed in this chapter result in no significant change in spending on the housing service of low-income families by any of the affected parties.
In this simple diagram, the situation under the existing public housing program can be represented by saying that one family is subsidized to extend its consumption by $bd$ units of housing service while the other family receives no subsidy. The inefficiency of this aspect of the existing program is conceptually measured by the sum of the area $igj$ and the area $hefg$. Since $0a$ is the value that society places on the resources used to produce a unit of housing service and the height of the demand curve $D$ is the value that society places on an additional unit of housing service for an eligible family, a reduction in the one family's consumption from $0d$ to $0c$ results in a gain in consumers' surplus equal to $hefg$ and the extension of the other family's consumption from $0b$ to $0c$ results in a gain of $igj$.\[19\]

In order to estimate the waste of giving a few a lot and the many nothing, it is necessary to make some arbitrary assumptions. To illustrate the method of making this estimate of waste, it is arbitrarily assumed that the amount of money that has been appropriated per eligible family is an indication of the extent of the social demand for housing service for the average eligible family in the special sense that this

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Prior to collective action both families would consume $Ob$ units of housing service per time period. The extension of one family's consumption from $Ob$ to $0c$ results in a gain in social welfare measured by $igj$. However, the further extension of this family's consumption to $0d$ results in a loss of social welfare measured by $hefg$. If $hefg$ is greater than $igj$, then collective action which increases one family's consumption from $Ob$ to $0d$ has resulted in a diminution of welfare. The empirical estimation of the waste of this feature of the existing program suggests that $hefg$ is more than 20 times greater than $igj$.\[19\]
amount is equal to the optimal quantity of housing service to be consumed by this low-income family multiplied by the social demand price at this optimal quantity. This assumption, together with the available facts, determines one point on the social demand curve for housing service. At the quantity associated with this point, the social demand price is only 8% of the total demand price. Some assumption must be made about the form of the social demand curve. Since the social demand appears to be only a small part of the total demand, the form of the social demand function assumed will not greatly affect the results. For ease of computation, it is arbitrarily assumed that the social demand curve is a rectangular hyperbola.

Consumer's surplus analysis will be used to make the estimates of the gains and losses due to the change in the pattern of subsidies. In this case consumer's surplus is particularly appropriate because the proposed changes would not result in any change in expenditure on housing service for low-income families by any individual. Because of the unitary price elasticity of private demand and the fact that occupants of public housing pay the same rent as eligible non-occupants pay for housing in the private sector, the proposed change would not affect the total amount that either present occupants of or other families

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20 This assumption does not foreclose the possibility that any program of housing subsidies to low-income families will be wasteful and, hence, no program should be undertaken.

21 The analysis of this section could easily be undertaken with different assumptions about the optimal appropriation for the program and the form of the social demand curve.
eligible for public housing would pay for the housing service that they consume. Consequently, both groups will have the same amount to spend on other goods before and after the change. By our assumption that the optimal amount of money has been appropriated, the taxpayers will be taxed the same amount before and after the changes proposed in this chapter. Hence, the taxpayers will also have the same amount to spend on other goods regardless of which pattern of subsidies is chosen. Since all parties to the changes will spend the same amount on other goods before and after the changes, the supply and demand curves for other goods will be unaffected by the changes. Consequently, an accurate estimate of waste can be obtained from the supply and demand curves for housing service alone.

Let us now use the arbitrary assumptions and a few facts to obtain the demand and supply curves needed to make the estimates of waste. These assumptions and facts are reflected in Figure 8. By construction, it will be shown that the assumptions made and the facts available completely determine the three demand curves. The data used to make the estimates of waste are averages for all eligible families. Consequently, the private demand curve applies to the average eligible family and the social demand curve is the vertical sum of other individual demands for housing service for the average eligible family for all reasons.²²

Let us now find the equation of the private demand for housing service by the average eligible family. The average tenant in public

²² With additional routine work, the estimate could be made more accurate by taking account of differences in the percentage of eligible families housed at different family income levels and family sizes.
housing paid a rent of $47 per month in 1965.\textsuperscript{23} Since the rent in public housing is 20% of income, this tenant had an income of $2820 \[=\text{($47)(12)(5)}\]. Equally eligible families who were not housed in public housing spent roughly the same percentage of their income on housing.\textsuperscript{24} Consequently, these families also spent $47 each month on housing service. Since Muth has found the price elasticity of private demand for housing service to be roughly -1, the demand price and quantity consumed are related by the following equation. In Figure 8,

\[
p_A \cdot q = $47
\]

this result is represented by defining a unit of housing service to be the greatest quantity of housing service which can be provided at a resource cost of $1.00 per month. At a price of $1.00, the quantity of housing service demanded by the average eligible family is 47 units. The private demand curve is the rectangular hyperbola through the point (47,1).

The derivation of the social demand curve is almost as easy. The federal taxpayer puts up the excess of the resource cost actually incurred to produce the housing service emitted by the public housing unit over the rent paid by the occupant. In the appendix to this chapter, the resource cost is calculated to be $103.45 per month per housing unit.\textsuperscript{25} We already have established that the average tenant


\textsuperscript{24} U.S. Department of Housing and Urban Development, Urban Housing Market Analysis, n.d., p. 73, Table 25.

\textsuperscript{25} Again administrative costs are ignored.
pays $47 per month for his public housing unit. Consequently, the average public housing tenant receives a subsidy of $56.45 \[=\$103.45-\$47.00\] per month from the taxpayers. As has already been pointed out, only 7 of every 100 eligible families receive a subsidy. We have assumed that all 100 eligible families should receive the same subsidy and that the amount of money actually appropriated correctly reflects the social demand. Since $\$395.15 \[=(\$56.45)(7)\]$ has been appropriated for each 100 eligible families, the rectangle under the social demand curve bounded by the optimal quantity is equal to $\$3.95 per month per eligible family. Since we have assumed the social demand curve to be a rectangular hyperbola, its exact functional form is --

$$p_B \cdot q = \$3.95.$$

In Figure 8, this result is represented by the rectangular hyperbola through the point (50.95, .08).

The total demand for housing service for the average eligible family is simply the vertical sum of the private and social demand curves.

$$p=p_A+p_B = \$47.00/q + \$3.95/q = \$50.95/q.$$ 

Since the resource cost of a unit of housing service is $1.00, the optimal quantity of housing service for each eligible family is 50.95 units per month. This is greater than the amount the family would consume in the absence of collective action. Figure 8 is now complete.
In order to obtain an estimate of waste from the unequal pattern of benefits which can be added to the estimate of waste due to the technical inefficiency of public production without double counting, we must start from the allocation of resources arrived at through the elimination of technical inefficiency without changing the pattern of benefits. In other words, we begin with a situation in which 7 of every 100 eligible families are consuming 75 units of housing per month at a resource cost of $1.00 per unit (i.e., point "d" in Figure 8) and in which 93 of every 100 eligible families are consuming 47 units per month at a resource cost of $1.00 per unit (i.e., point "b" in Figure 8). This situation is to be compared with a situation in which 100 of 100 eligible families are consuming 50.95 units of housing service per month at a resource cost of $1.00 per unit (i.e., point "c" in Figure 8).

Starting from the situation prior to a public housing program, the extension of an eligible family's consumption of housing service from 47 to 50.95 units per month results in a net gain equal to the area abc because society values this extension by an amount equal to the area under the total demand curve between 47 and 50.95 but values the resources necessary to provide this extension at an amount equal to the area under the supply curve between these two points. This net gain is $0.18 per month per family. Since there were 600,000 occupants of public housing at the end of 1965 and since only 7 percent of eligible families occupy public housing, there were 8,571,429 eligible
families at the end of 1965. CONSEQUENTLY, THE MAXIMUM GAIN POSSIBLE FROM A PROGRAM OF HOUSING SUBSIDIES OF LOW-INCOME FAMILIES IN 1965 WAS $18,514,287 [= (8,571,429)(12)($0.18)].

However, instead of extending the consumption of 8,571,429 families from 47 to 50.95 units of housing service each month, the consumption of 600,000 families was extended from 47 to 75 units. The extension of an eligible family's consumption from 50.95 to 75 units of housing service per month results in a net loss to society equal to the area cde in Figure 8. This value is $4.38 per month per family. THEREFORE, THE EXISTING PUBLIC HOUSING PROGRAM WHICH EXTENDS THE CONSUMPTION OF 600,000 OUT OF 8,571,429 EQUALLY ELIGIBLE FAMILIES RESULTED IN A NET LOSS TO SOCIETY OF $30,240,000 [= (600,000)(12)($4.38 - $0.18)] IN 1965 FROM THIS SOURCE ALONE.26 Even had there been no technical inefficiency in 1965, it would have been better to have had no program than to have had a program with the present pattern of subsidies.

Since the existing pattern of subsidies resulted in a net loss to society of $30,240,000 in 1965 and since the optimal pattern would have

26 Actually, all eligible families are not eligible for identical treatment. Poorer families of a given size pay less rent. Bigger families of a given income receive a greater quantity of housing service. The average income of eligible-and-in families may be less than, equal to, or greater than eligible-and-out families. For scholars to whom these facts are crucial, if the average income of eligible-and-in families exceeds the average income of eligible-and-out families, then the conclusion is strengthened. If the opposite is true, then the conclusion is weakened. However, since it is possible to be precise on this matter (i.e., to estimate the net gain to each group of families who are equally eligible), it is not necessary to use averages and talk in qualitative terms.
resulted in a net gain to society of $18,514,287, THE WASTE INVOLVED IN
THE EXISTING PATTERN OF SUBSIDIES WAS $48,754,287 IN 1965. Waste from
this source has been incurred since the inception of the program and
will continue to be incurred until the pattern of subsidies is corrected.

In order to reveal some relevant facts about the change from the
existing to the optimal pattern of subsidies, the gain from this change
is calculated in two additional ways. First, the waste of overextension
to the few is added to the waste of underextension to the many. Second,
the gains and losses of the change to the three major groups of families
involved are added.

It has already been shown that a diminution in the quantity of
housing service consumed by the average occupant of public housing from
75 to 50.95 units per month results in a net gain to society of $4.38
per month. There were 600,000 occupants of public housing in 1965.
HENCE, SOCIETY WOULD HAVE GAINED $31,536,000 [= (600,000)(12)($4.38)]
in 1965 BY DECREASING THE QUANTITY OF HOUSING SERVICE CONSUMED BY
PUBLIC HOUSING TENANTS TO THE OPTIMAL AMOUNT.

Similarly it has already been shown that an increase in the
quantity of housing service consumed by the average family eligible
for public housing from 47 to 50.95 units per month results in a net
gain to society of $0.18 per month. Since there were 8,571,429
families eligible for public housing during 1965 and since there were
600,000 public housing tenant families at the end of 1965, there must
have been 7,971,429 families who were equally eligible but who had
not been housed. THEREFORE, SOCIETY WOULD HAVE GAINED $17,218,287
[= (7,971,429)(12)(\$0.18)] IN 1965 BY INCREASING THE QUANTITY OF HOUSING SERVICE CONSUMED BY FAMILIES ELIGIBLE FOR BUT NOT SERVED BY PUBLIC HOUSING.

The total gain to society of the change from the existing to the optimal pattern of subsidies just calculated is, of course, the same as the gain previously calculated. However, this additional calculation reveals an interesting fact about the waste of the existing pattern of subsidies. IN 1965 THE OVEREXTENSION OF HOUSING SERVICE TO THE FEW WAS AN 83% MORE IMPORTANT SOURCE OF WASTE THAN THE UNDEREXTENSION TO THE MANY.

In the previous calculation, it was possible to talk about gains and losses to society because the acceptance of the existing distribution of ownership of productive factors gives a specific "weight" to the preferences of each individual. Scholars uneasy about accepting the existing distribution of wealth would want to know the distribution of gains and losses of the change in the pattern of subsidies. Fortunately, it is possible to estimate the gains and losses to the three affected groups of families eligible-and-in, eligible-and-out, and taxpayers. The sum of these gains and losses should also equal the net gain to society of the change. Families who occupied public housing under the existing pattern of subsidies would clearly have been made worse off by the change. Before the change, these families paid \$0.63 per unit of housing service and consumed 75 units. After the change, they would have paid \$0.92 per unit and consumed 50.95 units. In Figure 9, the loss to each member of this group is
equal to the area home. This loss is $17.81 per month. Since there were 600,000 families in this group in 1965, THE TOTAL LOSS TO THIS GROUP OF THE CHANGE WOULD HAVE BEEN $128,232,000 \[=($17.81)(600,000)(12)\] IN 1965.

Families who are equally eligible for public housing but who were not helped by the existing program would have been made better off by the change. Before the change, they paid $1.00 per unit of housing service and consumed 47 units. After the change, they would have paid $0.92 per unit and consumed 50.95 units. In Figure 9, the increase in the consumer's surplus of each member of this group is $ekj. This value is $3.90 per month. Since there were 7,971,429 families in this group in 1965, THE TOTAL GAIN TO THIS GROUP WOULD HAVE BEEN $373,062,877 \[=($3.90)(7,971,429)(12)\] IN 1965. CONSEQUENTLY, THE PROPOSED CHANGE IN THE PATTERN OF SUBSIDIES WOULD HAVE RESULTED IN A NET GAIN OF $244,830,877 \[=\$373,062,877-$128,232,000\] TO FAMILIES EQUALLY ELIGIBLE FOR PUBLIC HOUSING IN 1965. Since the change involved in the elimination of technical inefficiency does not affect the well-being of eligible families, these figures are also the total gains and losses to eligible families from the combined improvements in technical efficiency and the pattern of subsidies. 27

The calculations of the effect of the change in the pattern of subsidies on the well-being of the taxpayers is somewhat more difficult. 27

27 This follows from the specific way in which I separated into two parts the change from the existing situation to the optimal situation.
For them there is a change in both the gross benefits from and the
gross costs of the program. Let us look at the change in gross
benefits first.

The taxpayers value the extension of an eligible family's con-
sumption from 50.95 to 75 units of housing service by an amount equal
to the area under the social demand curve between these points. In
Figure 9, this area is denoted bcede. Its value is $1.52 per month.
Consequently, the contraction of the consumption of 600,000 eligible
families from 75 to 50.95 units would have resulted in a loss to the
taxpayers which they valued at $10,944,000 \[=($1.52)(12)(600,000)\] in
1965. On the other hand, the extension of an eligible family's con-
sumption from 47 to 50.95 units is valued by the taxpayers at an
amount given by the area abef. This amount is $0.33 per month.
Since the consumption of 7,971,429 eligible families would have been
extended by the change in the pattern of subsidies, the taxpayers
would have gained $30,610,287 \[=($0.32)(12)(7,971,429)\] in 1965 from
this part of the change. CONSEQUENTLY, THE TAXPAYERS WOULD HAVE
VALUED THE GROSS BENEFITS FROM THE PROPOSED CHANGE IN THE PATTERN OF
SUBSIDIES AT $19,666,287 \[=$30,610,287-$10,944,000\] IN 1965.

Since the estimate of waste from the inefficient pattern of sub-
sidies was begun from the allocation of resources which would have
resulted from the elimination of technical inefficiency without chang-
ing the quantity of housing service consumed by any eligible family,
public expenditures after the elimination of technical inefficiency
would be less than before the elimination of technical inefficiency by the amount of waste from this source. However, it has been assumed that the initial amount appropriated for the program correctly reflected the social demand for housing service to be consumed by low-income families. Consequently, starting from the situation after the elimination of technical inefficiency, a change in the pattern of subsidies will result in more public expenditures by an amount equal to the waste of public production of housing service. In particular, we have started this part of the analysis from the situation in which 600,000 eligible families are each receiving 75 units of housing service per month at a resource cost of $1 per unit. Each eligible family pays $47 per month for this housing service. Hence, the public subsidy is $28 per month per family. The total cost of the program to the taxpayers would have been $201,600,000 [=($28)(12)(600,000)]. After the change in the pattern of subsidies each eligible family would receive a public subsidy of $3.95 per month. Consequently, the public expenditure in the final position would have been $406,285,735 [=($3.95)(12)(8,571,429)].

The change in the pattern of subsidies would have resulted in a greater gross cost to the taxpayers of $204,685,735 [=($406,285,735-$201,600,000)] in 1965. Therefore, this change would have resulted in a net loss to the taxpayers of $185,019,448 [=($204,685,735-$19,666,287)] in 1965.

28 See page 85.

29 This figure differs from the waste of public production by less than one tenth of one percent.
Since the taxpayers would have gained $204,840,000 in 1965 from the elimination of the technical inefficiency of public production, the net effect of both changes discussed in this chapter would have been a gain of $19,820,552 [=$204,840,000-$185,019,448] in 1965. Consequently, the net effect of both changes would have been to improve the well-being of both taxpayers and eligible families as a whole. Within the group of eligible families, the 7,971,429 eligible-and-out families would have been helped and the 600,000 eligible-and-in families would have been hurt.

At this point, it is possible to derive another interesting implication of the assumptions which have been made. It will be shown that TAXPayers WOULD PREFER THE ABSENCE OF A PROGRAM OF HOUSING SUBSIDIES TO THE EXISTENCE OF EITHER THE PRESENT PROGRAM OR THE MOST EFFICIENT PROGRAM POSSIBLE. Under the present program, the consumption of 600,000 families is extended from 47 to 75 units of housing service per month. The taxpayers value this extension for each of the families at an amount equal to the area under the social demand curve between these two points. This value is $1.84. The subsidy currently paid to each of these families is $56.45. Hence, the present program resulted in a net loss to taxpayers of $54.61 [=$56.45-$1.84] per month per family housed in 1965. The total loss in 1965 was $393,192,000 [=(54.61)(12)(600,000)]. Under the most efficient program possible, all 8,571,429 eligible families would have consumed 50.95 units of housing service per month. These units would have been

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30 See page 85.
produced at a resource cost of $1.00 each. Hence, the resource cost of providing this housing would have been $50.95 per month per family. With benefit taxation, each eligible family would have paid $47 per month for its housing. Consequently, the taxpayers would have to put up $3.95 per month per eligible family. The value that the taxpayers place on the extension of the average eligible family's consumption from 47 to 50.95 units is given by the area under the social demand curve between these points. This area is $0.32. Therefore, the taxpayers would have suffered a loss of $3.63 [=3.95-0.32] per month per eligible family in 1965. The total loss would have been $373,371,447 [=($3.63)(12)(8,571,429)] in 1965.

Although a demand by individuals who do not directly consume the housing service is necessary to justify housing subsidies in the normative framework of this dissertation, it does not follow that these demanders are made better off by collective action. In the present case, these demanders are made worse off by even the optimal collective action justified by their demand. This seemingly strange phenomenon is explained by the fact that in the absence of collective action the taxpayers received benefits from the consumption of housing service by low-income households for which they paid nothing. Under collective action with benefit taxation, the taxpayers must pay their marginal evaluation of the last unit consumed on all units consumed by low-income families, not just on the additional units.

Although the taxpayers would prefer the absence of a program of housing subsidies to the existence of either the present program or
the most efficient program possible, they clearly prefer the efficient
program to the present program. Their gain from the change would be
the excess of their loss under the present program over their loss
under the most efficient program. In 1965 this gain would have been
$19,820,553 [=393,192,000-$373,371,447]. \(^{31}\)

One final point remains to be made in this section. The calcu-
lations of this chapter have not included the administrative costs
among the resource costs of the program and, hence, these costs were
not used to determine the extent of the social demand. In effect, it
has been assumed that congressmen do not take administrative costs
into account in determining how much to appropriate for the public
housing program and that administrative costs are irrelevant to the
determination of the optimal quantity of housing service for low-
income families. Neither of these assumptions is valid. TO INCLUDE
ADMINISTRATIVE COSTS IMPLIES THAT ANY PROGRAM OF HOUSING SUBSIDIES
WOULD HAVE RESULTED IN A NET LOSS TO SOCIETY. Let us proceed to
establish this result.

If the cost of administration is included, the resource cost
actually incurred to provide the average public housing unit was
$109.24 per month in 1965. \(^{32}\) The occupant of this unit paid $47 each
month in rent. Hence, the average public housing tenant received a
subsidy of $62.24 [=109.24-$47.00] per month from the taxpayers.
As has already been pointed out, only 7 of every 100 eligible families

\(^{31}\) This gain has already been calculated by a different means on
page 98.

\(^{32}\) This calculation appears in the appendix to this chapter.
received a subsidy. We have assumed that all 100 eligible families should have received the subsidy and that the amount of money actually appropriated correctly reflects the social demand. Since \$435.68 \left[ = (\$62.24)(7) \right] \text{ has been appropriated for each 100 eligible families,}

the rectangle under the social demand curve bounded by the optimal quantity is equal to \$4.36 per month per eligible family. Since we have assumed that the social demand curve is a rectangular hyperbola, its exact function form is

\[ p_B \cdot q = 4.36. \]

The private demand curve is still

\[ p_A \cdot q = 47.00. \]

Therefore, the total demand for housing service for the average eligible family is

\[ p = p_A + p_B = \frac{47.00}{q} + \frac{4.36}{q} = \frac{51.36}{q}. \]

The total demand curve \( D \) and the private demand curve \( D_A \) are depicted in Figure 10.

In the appendix to this chapter, the local and federal administrative costs are estimated to be \$5.79 per month per family housed. It seems reasonable to assume that this administrative cost does not vary with the quantity of housing service which the subsidized family consumes. For instance, we would not expect the administrative cost to
vary with the face value of a rent certificate. Consequently, the
administrative cost of $5.79 per month per family will be incurred
no matter how small an increase in the quantity of housing service
is subsidized. The marginal cost of providing this transfer activity
is depicted by the dashed lines in Figure 10.

The demand curve intersects the marginal cost curve at two points.
One point is associated with the quantity 47 and the other with 51.38.
It is easy to show that a local optimum occurs at 51.38 but that the
global optimum occurs at 47. It is obvious that a local optimum
occurs at 51.38. To see that the global optimum occurs at 47, we ask
what value society places on the increased consumption of housing
service by the eligible family and the cost of this increased con-
sumption beyond 47 units. The value that society places on the in-
crease from 47 to 51.38 is given by the area under the total demand
curve between these points. This value is $4.57 per month per family.
The resource cost of this additional housing service is $4.36
\[=($1.00)(51.36-47)\] and the cost of administering the transfer activity
is $5.79 per month per family. Hence, the total resource cost is
$10.15 per month per family. The extension of the quantity of housing
service consumed by the average eligible family from 47 to 51.36
units results in a net loss to society of $5.58 \[=\$10.15-\$4.57\] per
month.
THEREFORE, EVEN THE MOST EFFICIENT PROGRAM OF HOUSING SUBSIDIES REPRESENTS ONLY A LOCAL OPTIMUM. THE GLOBAL OPTIMUM REQUIRES THE ABSENCE OF ANY PROGRAM OF HOUSING SUBSIDIES.

All of the conclusions of this section are based on arbitrary assumptions. Of these assumptions, the assumption that actual appropriations correctly reflect the extent of the social demand is the most crucial. Once this assumption is accepted, the social demand is necessarily small relative to the total demand, and radical changes in the assumptions about the form of the social demand curve are unlikely to alter greatly the conclusions of this section.

Slum Clearance

Public housing legislation has required the destruction of one sub-standard housing unit for each public housing unit built. This feature of the public housing program is inconsistent with the motives for subsidies to low-income families which have been discussed and is inconsistent with any motives which can be represented in the form of a demand for housing service for low-income families. The proof of this proposition is straight-forward.

If the externalities which justify collective action are Pareto relevant, then efficient resource allocation requires that low-income families consume more housing service than they would consume in the absence of collective action. In the short run, slum clearance (i.e., the destruction of housing units emitting a flow of services less than

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some fixed amount) results in a decreased supply of housing units yielding small amounts of housing service. Consequently, the price of these housing units will rise relative to the price of standard units. Some of the occupants of slums will be induced to move to "standard" housing. However, in the long run, marginal housing units will be allowed to deteriorate to the sub-standard level to take advantage of the short run profits resulting from the destruction of part of the supply in this sector. In the long run, the destruction of slums does not affect the consumption pattern of low-income households because it affects neither the demand for housing service by low-income families nor the technical conditions of supply of housing. The long run effect of slum clearance is analogous to the long run effect of a flood. As already mentioned, 90 percent of the adjustment to long run equilibrium in the housing market occurs in 6 years.

If the normative assumptions of this dissertation are accepted and if the positive analysis is correct, then slum clearance has no place in a program of housing subsidies to low-income families.
Appendix

The Cost of Public Housing

Some of the costs of public housing are incurred at the time of the construction of the housing project. The rest of the costs are incurred during the lifetime of the project. In order to facilitate comparisons, all stock figures will be converted to flows per month in 1965 prices for the average public housing unit. Some of the costs of public housing are the costs of administering a transfer program rather than the costs of producing housing service. In order to correctly compare the relative efficiency of private versus public production of housing service, these administrative costs must be subtracted from the total cost of public housing.

In making an estimate of the capital cost of public housing, we follow Smolensky closely. He finds that the cost of construction of the average public housing unit built between February 1952 and December 1964 under the authorization of Public Law 171 was $13,400. He argues that the yield earned on FHA mortgages bought on the secondary mortgage market is a conservative estimate of the appropriate discount rate. A weighted average of these yields during the period from 1952

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34 By administrative costs of a transfer program, I mean costs in addition to those that are incurred by private entrepreneurs who provide housing service. The cost of checking the eligibility of applicants for public housing is an administrative cost of a program of housing subsidies to low-income families. The cost of collecting the rent is a cost of providing housing service.

35 Smolensky, "Public Housing or Income Supplements...," pp. 95-96.
to 1964 was 5%. Smolensky also argues that the economic life of the average unit is 40 years. He concludes that the capital cost of the average public housing unit expressed as a flow per month was $62. To be exact, the figure is $62.53. To obtain the total resource cost of the average public housing unit, Smolensky adds the rent paid by the tenant for the average unit. This rent was $47 and, hence, the total resource cost was $109.53. This procedure would be correct if the rent paid by tenants is applied only to the cost of producing housing service, if none of the rent is applied to the capital cost of producing housing service, and if all non-capital costs are paid from this source. Since only the last assumption is valid, some adjustments of Smolensky's estimate will be made.

Part of the $47 paid by the tenant is used to defray local administrative costs. These are not costs of producing housing service. Consequently, they should be subtracted from the rent paid by the tenant in order to obtain the cost of providing housing service. It appears that administrative and management expenses of the LPHA are lumped together in the Annual Report of the U.S. Department of Housing and Urban Development. However, it is possible to make an estimate of the part of this lump sum attributable to the administration of the transfer program.

According to the Annual Report of the U.S. Department of Housing and Urban Development, the local management and administrative expense of operating public housing projects was 15.5% of project revenues in
1965.\textsuperscript{36} Since the average public housing tenant paid a rent of $47 per month, local management and administrative expenses were $7.29 \[= (.155)(\$47)\] per month per occupied unit. Part of this expense is the management expense of providing housing service. The other part is the administrative expense of conducting a transfer program. According to Robert Fisher, management expenses are 5 percent of revenues for private rental housing operations.\textsuperscript{37} In other words, $3.75 per month in management expenses would be incurred to provide a housing unit which emits a flow of service worth $75 per month in the private market. It will be assumed that this same ratio holds for public housing units. Since the average public housing unit emits a flow of services with a market value of $75 per month, we infer that $3.75 of the $7.29 spent on administration and management of the average public housing unit each month is attributable to the provision of housing service. Consequently, it is estimated that local administrative costs of this transfer program are $3.54 \[= \$7.29 - \$3.75\] per month per housing unit.

Part of the $47 paid in rent by the tenant is used to defray the capital cost of producing housing service. Since the figure already obtained for the capital cost includes the entire capital cost, to add the part of capital costs defrayed by the rent of tenants to the estimate of total capital cost would be to double count. The part of the tenant's rent used to defray capital costs is called residual receipts. Smolensky's best estimate of residual receipts was $2.54 per month per housing

\textsuperscript{36} U.S. Department of Housing and Urban Development, Annual Report 1965, p. 177, Table 138.

This must be subtracted from the rent paid by the tenant of the average public housing unit.

If we subtract the local administrative costs and residual receipts from the rent paid for the average public housing unit, then we obtain the non-capital costs of providing the housing service emitted by this average unit. This figure is $40.92 \[= 47.00 - 3.54 - 2.54 \]. Adding this figure to the figure for capital costs, we obtain the total resource cost actually incurred to produce the housing service emitted by the average public housing unit. This figure is $103.45 \[= 62.53 + 40.92 \].

The cost estimates obtained thus far and several other estimates which can be derived from them are displayed in Table 1 at the end of this appendix. Let us turn to the derivation of these other cost estimates.

Of the $47 paid in rent for the average public housing unit, $3.75 pays for the management of the housing project, $3.54 for the local administration of the program, and $2.54 for part of the capital cost. Hence, $37.17 \[= 47.00 - 3.75 - 3.54 - 2.54 \] pays for the operating expenses (e.g., maintenance and repair) of the public housing unit.

Since $2.54 of the total capital cost of $62.53 is paid by the tenants, $59.99 \[= 62.53 - 2.54 \] is paid directly or indirectly by the federal taxpayer. Since the administrative cost of the federal PHA was $16,173,183 in 1965 and since there were 600,000 public housing

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38 Smolensky, "Public Housing or Income Supplements...," pp. 96.
units in that year, the federal administrative cost of the transfer program was $2.25 \equiv \frac{(16,173,183)}{(12)(600,000)} per month per public housing unit. Consequently, the cost borne by the payers of federal taxes was $62.24 \equiv ($59.99 + 2.25) per public housing unit per month.

The derivation of the costs per month per housing unit in Table 2 from the figures in Table 1 is self evident. The cost per month per unit of housing service is obtained by dividing the cost per month per housing unit by 75. In Chapter IV it is shown that, if we consider the price of a unit of housing service in the private market to be $1, then the average public housing unit emits 75 units of housing service per month.

For Table 3 it is assumed that the costs which have been calculated for the 360,000 public housing units constructed between February 1952 and December 1964 under the auspices of Public Law 171 apply also to the 240,000 other public housing units in existence in 1965. Consequently, the total resource cost of the public housing program was $786,528,000 \equiv (109,24)(12)(600,000) in 1965. Of this amount $744,840,000 \equiv (103.45)(12)(600,000) was used to produce housing service and $41,688,000 \equiv (5.79)(12)(600,000) was used to administer the program. Of the total resource cost $338,400,000 \equiv (47)(12)(600,000) was offset by the rents paid by public housing tenants. The expenses of the program met directly by federal taxpayers and listed as total expenses of the program in the Annual Report of the FHA was $237,810,073. The

\footnote{U.S. Department of Housing and Urban Development, \textit{Annual Report}, 1965, p. 171, Table 132.}
federal taxpayer indirectly paid the remaining $210,317,927 [=\$786,528,000-\$338,400,000-\$237,810,073] in the form of the tax exempt status of the interest earned on local authority bonds and transfers of housing to the PHA from other government agencies without monetary consideration.

Although the cost estimates of this appendix are rough, at least they are relevant to an evaluation of the program within a well-defined normative framework.

<table>
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<tr>
<th>WHO PAYS AND FOR WHAT PURPOSE</th>
<th>COST PER MONTH PER HOUSING UNIT</th>
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<tr>
<td>Tenant</td>
<td>$47.00</td>
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<td>Operating Costs</td>
<td>$37.17</td>
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<td>Management of housing</td>
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<tr>
<td>Local administration of</td>
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<tr>
<td>transfer program</td>
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<tr>
<td>Capital Costs</td>
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</tr>
<tr>
<td>Federal Taxpayers</td>
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<tr>
<td>Capital Costs</td>
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<tr>
<td>Federal administration of</td>
<td></td>
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<tr>
<td>transfer program</td>
<td>2.25</td>
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<tr>
<td></td>
<td>109.24</td>
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Table 2  
(1965 prices)

<table>
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<tr>
<th>FOR WHAT PURPOSE</th>
<th>COST PER MONTH PER HOUSING UNIT</th>
<th>COST PER MONTH PER UNIT OF HOUSING SERVICE</th>
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<td>Housing service</td>
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<tr>
<td></td>
<td><strong>109.24</strong></td>
<td><strong>1.46</strong></td>
</tr>
</tbody>
</table>

Table 3  
(1965 prices)

TOTAL COSTS

Total annual resource cost of the public housing program $786,528,000

Of housing service $744,840,000
Of administration 41,688,000

Paid by tenants 338,400,000
Paid directly by taxpayers 237,810,073
Paid indirectly by taxpayers 210,317,927
Chapter V

OPTIMAL METHOD FOR PROVIDING HOUSING SUBSIDIES

There is no reliable way (at present) to determine the optimal housing subsidies to low-income households. However, if the motives for these transfers have been correctly specified, then there exists no better method of organizing the program of housing subsidies to low-income households than through a rent certificate plan. There are worse ways of organizing the program. The existing public housing program is one such way. ¹ Furthermore, in the particular case of housing subsidies, it is possible to determine how much to charge for the rent certificate in accordance with our pricing rule for social goods (i.e., benefit taxation) independent of the correct face value of the certificate.

Conceptually, the task of organizing a program of housing subsidies is straightforward. For convenience, Figure 3 is drawn again and denoted Figure 11. The optimal quantity of housing service is 0a. Under the pricing rule adopted for social goods, A should pay a price of 0h per unit of housing service and B should pay 0i for each unit consumed by A. Hence, the government should sell a (rent) certificate to A. This certificate can only be used to purchase housing service. The face value of the certificate should be 0afg (=0aeh+0aki). A should pay 0ach for this certificate. The government should collect

¹ Chapter IV contains the proof of this statement.
Oaki from B in taxes. The amount paid by A plus the amount paid by B is sufficient to redeem the certificate from the seller of housing service.\(^2\)

Even though it is not possible (at present) to infer the magnitude of the optimal subsidy, it is possible to estimate the correct amount to charge the recipient for the certificate. Referring to Figure 11, it is clear that the correct amount is given by the rectangle under A's demand curve bounded by the optimal quantity. If the optimal quantity is \(O_a\), then the correct price to charge for the certificate is \(O_{aeh}\). Muth has shown that the price elasticity of demand for housing service is about \(-1\).\(^3\) Consequently, the rectangle has the same area for all levels of output. Regardless of the optimal quantity of housing service for A, he should be charged an amount equal to the amount that he would have spent on housing service in the absence of collective action. Therefore, the task of policy formulation has been simplified to determining how large a rent certificate each person should be allowed to purchase.

Probably because of cost considerations, government policy does not treat individuals as individuals but rather treats large groups of individuals as if they were similar. This policy is consistent with the general approach of this dissertation, but the relevant cost considerations have not been explicitly introduced. Assuming that the existing aggregation is justified by these cost considerations, the preceding

\(^2\)It is interesting to note that one of the recently inaugurated programs of food subsidies to low-income families, namely the Food Stamp Program administered by the Department of Agriculture, is organized in exactly this way.

\(^3\)Muth, "The Demand for Non-Farm Housing," p. 58.
policy implication is easily amended. If A is the average person in some group subject to identical treatment, then all people in this group will be allowed to buy a rent certificate of the same face value for the same price as A.

In the case of public housing, all families with the same income and family size are eligible for the same total quantity of housing service at the same rent. The correct amount to charge a family for its rent certificate is the total expenditure on housing service (in the absence of collective action) by the average family with the same income and of the same size. These numbers can be obtained directly from the Census of Housing and Population. Consequently, it is easy to calculate the cost to the taxpayer of alternative patterns of rent certificates. Using data from the same source, it is also easy to calculate the effect of these rent certificate plans on the number of families occupying "sub-standard" housing units because the experience of families using a rent certificate with a face value of X will be the same as the experience of families who spent X on housing prior to the rent certificate with respect to the occupancy of sub-standard units.

The rent certificate plan has been considered and rejected by many housing specialists. The following statement is typical.

"Welfare agencies in many states in this country do issue rent certificates to families on relief. During the Depression years, millions of families received such payments. However, housing specialists in the
United States usually oppose the broader rent certificate plan on the grounds that it would be too expensive and that it would not contribute to the expansion of the housing supply. The expenditure of several billion dollars per year for rent subsidies would evoke a corresponding improvement in the housing supply only if it would be linked to a continuing program of housing code enforcement and new building. Without this safeguard, the sum would create inflationary pressures which would raise prices or rents on the old, sub-standard housing occupied by the families that would be eligible for subsidies. Eventually, of course, the increased consumer demand arising from family subsidies might result in some increased production of new housing. But in the meantime the excessive demand relative to the fairly stable supply of housing could create large windfall gains for the owners of existing sub-standard properties and low-priced units.\textsuperscript{4}

This view of the effects of a rent certificate plan is completely distorted. Let us examine this statement one point at a time. First, a rent certificate plan may be smaller than, the same size as, or larger than the existing program of housing subsidies to low-income families. A rent certificate plan designed to give families who would otherwise enter public housing the same quantity of housing service at the same rent as in public housing would be 28 percent less costly.

to the taxpayer than public housing.\textsuperscript{5} Second, to say that a rent certificate plan would not contribute to the expansion of the supply of housing service is to say that the long run supply of housing service is completely inelastic. No evidence is presented to support this view. On the other hand, Muth has presented substantial direct and indirect evidence to the effect that the long run supply of housing service is perfectly elastic.\textsuperscript{6} Third, it is admitted that "eventually ... the increased consumer demand arising from family subsidies might result in some increased production of new housing." The clear implication is that this effect is very slow in coming and that the adjustment is rather partial. The evidence in Chapter II suggests (although not compellingly) that the housing market is quite competitive. Consequently, in the long run the supply of housing service will adjust perfectly to the increased demand. Muth's econometric study also tells us that we can expect one-third of the adjustment in the first year and 90 percent in six years.\textsuperscript{7} These adjustments will occur in the absence of "a continuing program of housing code enforcement and new building" (stimulated or conducted by government). There would be short run rent increases for packages of housing service with

\textsuperscript{5} See Chapter IV.

\textsuperscript{6} Muth, "The Demand for Non-Farm Housing," pp. 42-46 for the direct evidence. The fit of the equations is indirect evidence since this is one of the assumptions on which his statistical estimation of the parameters of the demand function for housing service is based.

\textsuperscript{7} Muth, "The Demand for Non-Farm Housing," especially pp. 49-52.
a cost at and somewhat below the face value of the rent certificates. Consequently, there will be windfall gains to some owners of "sub-standard" housing. However, many of these same owners will also suffer windfall capital losses from the program because the program will eliminate the demand for the worst housing. The net windfall gains (if any) would seem to be a small price to pay for the elimination of the inefficiencies of the public housing program which have been incurred every year since its inception and will continue to be incurred in the absence of reform.

There is a cliche that simplicity is a virtue. The virtue of the simplicity of a rent certificate plan is that it allows us to achieve exactly what we want to achieve. It contains no features which hinder efficient resource allocation.
Chapter VI

CONCLUSION

This dissertation contains too many conclusions to be usefully included in a comprehensive summary. Consequently, the conclusion will be limited to a list of some of the more important general findings and to some suggestions for future research.

The Findings

1. It is possible to extend Pareitian welfare economics to make it useful for the evaluation of transfer-in-kind programs conducted by the government. The welfare economics model of this dissertation permits the use of consumer's surplus analysis to choose between alternative means of satisfying specific redistributive wants and to estimate the waste of using inefficient means.

2. Housing service to be consumed by low-income families appears to be a good to some high-income families. These high-income families may be properly said to have a demand for housing service for low-income families. These demand functions presumably have the same general properties as demand functions which have been estimated.

3. The market for housing service is quite competitive.

4. It is possible to prove theorems concerning how the optimal transfer varies with the incomes of recipients, the incomes of taxpayers, and the cost of production of the transfer activity, but these theorems are much weaker than familiar statements concerning these relationships.
5. The PHA is grossly inefficient as a producer of housing service compared to the actual performance of private producers. The unequal pattern of subsidies among equally eligible families appears to be a significant but much smaller source of waste in public housing.

6. The best method of conducting a program of housing subsidies to low-income families is a rent certificate plan. This method has no features which hinder efficient resource allocation.

Suggestions for Future Research

With respect to the evaluation of public housing, the first priority is to obtain more reliable estimates of some data (e.g., the amount that the average eligible family not served by public housing spends on housing service). Second, sensitivity analysis particularly with respect to the optimal appropriations for the program and the form of the social demand curve should be undertaken. Third, the estimates of waste should be made by family size and family income. The necessary data probably can be obtained from the Census of Housing and the records of the PHA. Fourth, the estimates of waste should be made for each year of the program's existence. Fifth, the theoretical framework developed should be applied to additional features of the public housing program. For example, preliminary analysis suggests the following features of the existing public housing program to be inefficient: (1) the provision of the same quantity of housing service to a family in a locality where the cost of production of housing service is high as to a family of the same size and income living in
a locality where the cost of production is low, (2) the provision of the same quantity of housing service to the families of veterans as to other families of the same size and income, and (3) the provision of the same quantity of housing service to families of the same size but different income. Finally, the implications of various rent certificate plans for the number of families living in "sub-standard" housing could be derived. Unlike urban renewal, a rent certificate plan results in a net reduction in occupied sub-standard units. Consequently, the rent certificate plan should be considered as an alternative to the existing urban renewal program as well as to the existing public housing program.

It is hoped that this development of a normative theory of transfers as an extension of Paretian welfare economics and this illustration of its applicability to detailed choices between alternatives will stimulate similar studies of other government transfer programs which will result in a refinement of the method developed here. It is also to be hoped that normative theories alternative to Paretian welfare economics which are able to distinguish between different means of conducting transfer programs will be developed.
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