383-76

INSTITUTE FOR RESEARCH ON POVERTY DISCUSSION PAPERS

A COST-EFFECTIVENESS STUDY OF LEASED PUBLIC HOUSING

John F. Morrall III

Edgar O. Olsen

UNIVERSITY OF WISCONSIN - MADISON

A COST-EFFECTIVENESS STUDY OF LEASED PUBLIC HOUSING

John F. Morrall III
Council on Wage and Price Stability, Executive Office of the President
726 Jackson Place, N.W., Washington, D.C. 20506

Edgar O. Olsen
Department of Economics, University of Virginia
Charlottesville, Virginia 22901

November 1976

This study is a part of the in-house research program of the Office of Program Analysis and Evaluation of the Office of the Assistant Secretary for Policy Development and Research in the U.S. Department of Housing and Urban Development. John Morrall designed the study, supervised the collection of data, and completed a preliminary analysis while he was employed in this office. As a consultant to the Office of Program Analysis and Evaluation, Edgar Olsen provided advice in the early stages of the study, supervised the editing of the data, analyzed it further, and had the primary responsibility for writing the final report. He should receive all correspondence concerning this paper. Completion of the study was facilitated by funds granted to the Institute for Research on Poverty, at the University of Wisconsin-Madison, by the Department of Health, Education, and Welfare pursuant to the Economic Opportunity Act of 1964.

ABSTRACT

The purpose of this study is to determine the cost-effectiveness of various ways of providing housing services for low-income families through the leased public housing approach, whereby a local housing authority leases from the private sector and sublets to tenants for no more than 25 percent of their adjusted incomes.

The paper compares the cost-effectiveness of programs involving the leasing of new housing versus those involving existing housing. Our evidence tends to favor the hypothesis that the former is slightly more cost-effective than the latter.

Other study findings are (a) that using FHA financing increases the cost of the leased housing program by about 18 percent, and (b) that leasing single-family homes costs over 8 percent more than providing comparable units in a fully-leased apartment building.

The study found no evidence that other policy decisions--such as particular methods of obtaining units and assigning families; responsibility for rent collection and repairs; the number of years a unit remains in the program--affect the cost-effectiveness with which housing services are provided. This suggests that such decisions can be made without regard to cost-effectiveness.

A COST-EFFECTIVENESS STUDY OF LEASED PUBLIC HOUSING

The purpose of this study is to determine the cost-effectiveness of various ways of providing housing services for low-income families through the leased public housing approach. In this approach a local housing authority (LHA) leases units from the private sector and in turn sublets them to low-income tenants for not more than 25 percent of their adjusted incomes.

The leased public housing approach was first made possible by the 1965 amendments to the United States Housing Act of 1937. Before that, public housing was mainly of the "conventional" type whereby the LHA purchased sites and supervised planning, construction, and management. A third type also developed in 1965 is known as the Turnkey I procedure; it allows the LHA to purchase units proposed, designed, and constructed by private developers on their own sites.[1]

From 1974 through the first quarter of 1976, leased public housing has been the dominant form of newly provided low-rent public housing; 95 percent of the 385,000 applications received by the Department of Housing and Urban Development (HUD) for low-rent public housing during this period were for leased units.[2] However, just recently the Housing Authorization Act of 1976 was passed in an attempt to breathe new life into the old, non-leased, low-rent public housing programs.

Summary of Results

One of the reasons for the emphasis on the leased-housing approach in providing housing services for low-income groups was that it was thought that the leased-housing approach was more cost-effective than the conventional or turnkey methods. The National Housing Policy Review Task

Force calculated in 1973 that it costs $1.03 to produce a dollar's worth of housing services using the leased approach, $1.23 using the turnkey approach, and $1.40 using the conventional approach.[3] The investigators were unable to provide separate estimates for either newly constructed (and then leased) or existing leased public housing. Since a major difference between the three variants compared was that the former made considerable use of the existing stock while the latter two rely on new construction, they also concluded that housing services are produced more efficiently under the leased-existing program than under the leased-new program.[4]

The evidence presented in this paper, although generally supporting the magnitude of the cost-effectiveness ratio for leased public housing reported in the National Housing Policy Review study, does not support the hypothesis that the leased-existing program is more cost-effective than the leased-new program. In fact, what evidence we did find tends to favor the opposite hypothesis; i.e., that the leased-new program is slightly more cost-effective than the leased-existing program.

In addition to examining the differences in cost-effectiveness among leasing programs--new, existing, and rehab--we also attempted to determine whether differences in the way these programs have been operated have affected cost-effectiveness. Such information would allow policy-makers to design more efficient programs.

An important finding that corroborates a conclusion of the National Housing Policy Review study concerns the cost-effectiveness of the Federal Housing Administration's (FHA) financing programs for the construction of rental housing. The National Housing Policy Review study found that it costs from 10 to 20 percent more to construct FHA Section 236 rental housing than comparable private units.[5] Our results indicate that using

FHA financing increases the cost of the leased housing program by about 18 percent.

A second important finding is that leasing single-family homes is cost-ineffective relative to leasing apartments. We estimate that it costs over eight percent more to provide comparable detached units than to provide units in an apartment building fully leased by the LHA.

We are much less certain about the effects of variation in other program parameters. Taking into account the directions of possible bias in our estimates as well as the significance of the coefficients, we are not able to recommend on cost-effectiveness grounds:

(1) that the LHA rent any specific percentage of units in a building;

(2) that the LHA use any particular method of obtaining units and assigning families to them;

(3) that the LHA either delegate or take responsibility for collecting rents;

(4) that the LHA either delegate or take responsibility for maintenance and repairs;

(5) that the years a unit stays in the leased program be limited or increased;

(6) that counseling of tenants be utilized;

(7) that the LHA emphasize housing for the elderly;

(8) that HUD allocate funds to any particular LHA's.

Although these findings are negative in the sense that we cannot recommend conclusively any policy actions that would increase the cost-effectiveness with which housing services are provided, they are useful in that they suggest that decisions on these matters can be made without

worrying about cost-effectiveness. For example, it may be desirable to limit the percentage of units in a building that an LHA may lease if this produces a mixing of income groups or maintains the anonymity of the families receiving subsidies. It may also be a social goal to take better care of the elderly than of other low-income groups. Finally, it is probably good public policy to allow families to find their own housing rather than being assigned units, given that there is apparently no cost-effectiveness difference in the two approaches.

The next section details the rather involved process that we used to estimate the cost-effectiveness of the various ways that leased public housing is provided in the United States. The last section discusses our results and their policy implications.

Methods and Data

The definition of cost-effectiveness adopted for this study is the ratio of the total cost of providing a leased public housing unit to its market rent. Total cost includes the rent paid to the owner, tenant-paid utilities, and expenses of the LHA attributable to the unit. The market rent of a unit is the amount that it could be rented for in the private market. We view market rent as an index of the desirability of units within a single housing market.

In principle, we would like to have an accurate measure of this ratio and data on the operation of the program as it pertains to each of a large number of leased public housing units. For example, is the unit in a building which was built especially for the program? What percentage of the units in the building are occupied by subsidized families? Who is responsible for maintenance? This data would be used to calculate the mean cost-effectiveness ratio for the major variants

of leased public housing (i.e., new, existing, and rehab) and then to estimate a statistical relationship between this ratio and program characteristics which would show how the former varies with each of the latter after taking account of the influence of other program characteristics.

In fact, our estimates of the cost-effectiveness ratio are not completely accurate because (1) we were not able to allocate LHA expenses (other than rent paid to owners) to individual units exactly and (2) we had to predict market rents. There are reasons to believe that the resulting errors in measuring the cost-effectiveness ratio are correlated with the program characteristics and hence will lead to biased estimates of the coefficients in the relationship between the cost-effectiveness ratio and these characteristics. We responded to this problem in two ways. First, we included variables in the regression which could be expected to reduce the biases. Second, we discuss the likely directions of the biases in our discussion of the results.

We did have the answers to more than a hundred questions for a sample of 1155 occupants of leased public housing. The interviews and inspections were conducted by personnel from HUD Area Offices during June and July of 1974. Table 1 shows the number of leased public housing units of each type in each city in the original sample. The empirical results are based on a subset of the original sample because crucial questions were not answered in many cases. These interviews and inspections provided us with information on the rent paid to owners, program characteristics as they pertain to individual units, and characteristics of the occupants and their housing. We will now describe how we used these data to estimate the total cost and market rent of

Table 1

Number of Leased Public Housing Units in Original Sample

City	Total	Program Type		
		New	Existing	Rehab
Boston	84	28	24	32
New Haven	75	20	55	0
New York	140	51	37	52
Pittsburgh	75	0	74	1
Atlanta	180	6	174	0
Orlando	177	103	74	0
Chicago	177	48	52	77
San Diego	147	62	84	1
Dickinson, Grand Forks, Jamestown, Mandan, and Minot, North Dakota	100	100	0	0
Totals	1155	418	574	163

leased public housing units.

Total Cost

The total cost of providing a leased public housing unit is the sum of the rent paid to the owner, tenant-paid utilities, and the expenses of the LHA attributable to the unit. We know the former two magnitudes from the interviews. We do not know the latter, but have used data from the interviews and each authority's Statement of Operating Receipts and Expenditures to approximate it. We will discuss these approximations under three headings: (1) utilities, (2) maintenance, and (3) other operating expenses.

Utilities. From the interview, we learned which utilities were included in rent. If a utility was not included, then either it was not used or the tenant paid for it. In these cases, we could exactly account for the cost of the utility because this information was obtained during the interview. If the utility was included in rent, then either the landlord pays the bill, in which case the rent that he receives from the LHA accounts for this part of the total cost, or the LHA pays it directly. In the latter case, something should be added to the rent received by the owner and tenant-paid utilities to get total cost. Unfortunately, we failed to learn which of the two possibilities prevailed for the individual units in our sample. Therefore, we allocated to each unit which had a utility included in rent an equal share of the total LHA expenses for that utility. On this account, total cost will be overestimated in cases where the landlord paid for the utility and underestimated on average if the LHA paid.

Maintenance. We also learned from the inverview who maintained

the unit. If the landlord made the repairs, then their cost is included in the rent that he received. If the LHA made the repairs and billed the owner, then the rent paid to the owner accounts for the cost of maintenance. If the LHA made and paid for repairs, then the cost should be added to other costs in calculating the total. Unfortunately, we failed to learn who paid for the maintenance of the individual units in cases where the LHA made the repairs. Therefore, we allocate to each unit maintained by the LHA an equal share of LHA expenses for ordinary maintanance and operation.

Other Operating Expenses. All units were allocated an equal share of other LHA operating expenses. We attempted to improve upon this allocation by assuming that such expenses per unit per month in real terms depend only on program type. With this assumption, the per-unit expenses of each program type can be estimated by regressing other operating expenses per unit in real terms in the nine cities on the proportion of units of any two of the three types. The results imply that the other operating expenses of existing and new are virtually identical and are about 46 percent less than that of rehab. However, the R-squared and t-scores were so small that we abandoned this approach.

Market Rents

Since leased public housing units are not rented in the private market, we must predict their market rents. We considered two ways of making these predictions: (1) hiring appraisers and (2) using estimated relationships between rent and housing characteristics for units in the private market.[6] If cost were not a consideration, the second approach would involve collecting information on the rent and charac-

teristics of several hundred unsubsidized dwelling units in each city, regressing rent on characteristics for each city separately, and substituting the characteristics of each leased public housing unit into the appropriate estimated relationship in order to predict its market rent. This approach would be roughly as expensive as using appraisers. In the interest of economy, we chose a much less costly version of the second approach.[7]

First, we used previously collected data to estimate relationships between the rent and characteristics of unsubsidized housing. Specifically, we used data on 215 dwellings in New Haven collected in the fall of 1968 by A. Thomas King and Peter Mieszkowski for their study of racial discrimination.[8] We also used data on 469 units in Phoenix and 470 in Pittsburgh collected by Abt Associates in the summer of 1973 as a part of the Experimental Housing Allowance Program. The equations estimated using these data are presented in Tables 2 and 3. Two points are worthy of note. We assumed that the effect of some characteristics (e.g., quality of plumbing) on rent is independent of floor space while the effect of others (e.g., quality of floors, walls, and ceilings) depends on the size of the apartment. Also, in using these equations to predict the market rents of leased units, we assumed that the landlord was not a relative because we want market rent to measure the desirability of the housing and we do not believe that a landlord will give the government a discount for a subsidized tenant who is a relative. The only apparent anomaly in the results is that apartments in areas with street lighting have a lower market rent. We attribute this to a concentration of lighting in areas with high crime rates.

Table 2

Market Rent of Housing Units as a Function of Characteristics of the Housing and its Occupants: New Haven, 1968

Characteristics of Housing and Occupants	Amount Added to Gross Monthly Rent
Amount added to gross monthly rent independent of floor space:	
All units	$45.09
Thermostat present	1.06
One unit increase in quality of plumbing fixtures on a scale of 1 to 10	4.56
Each stove or refrigerator included in rent	3.52
Each other appliance included in rent	8.60
Each extra feature from among balcony, fireplace, carpeting, off-street parking	.76
Each person per 100 square feet of floor space	16.75
Each 100 square feet of floor space per room	-10.85
Amount added to gross monthly rent for each 100 square feet of floor space:	
All units	3.84
One unit increase in quality of floors, ceilings, and walls on a scale of 1 to 10	.22
Each electrical outlet per room	.33
Furniture included in rent	1.09
Family has lived in city for less than two years	1.06
Landlord lives in building or immediate neighborhood	-.83
Landlord is relative	-1.71
Head of household is female	.48
Head of household is black	.95

Note: Prior to estimating these parameters, all variables were divided by floor space measured in hundreds of square feet. In this sample of 215 housing units, the explanatory variables accounted for 70 percent of the variance in gross monthly rent per 100 square feet of floor space.

Table 3

Market Rent of Housing Units as a Function of Characteristics of Housing and its Neighborhood: Phoenix and Pittsburgh, 1973

Characteristics of Housing and Neighborhood	Amount Added to Gross Monthly Rent	
	Phoenix	Pittsburgh
Amount added to gross monthly rent independent of floor space:		
All units	$ 23.17	$ 67.47
Street is expressway	-6.53	-10.43
Street is major road	4.18	-3.20
Street is arterial	2.47	.11
Street is residential with through traffic	.00	.00
Street has no through traffic	1.31	2.34
Street is rural road	-36.53	--
Abandoned cars present in neighborhood	-2.59	-7.37
Boarded up or abandoned buildings present in the neighborhood	-.64	-8.46
Street lighting present in neighborhood	-7.10	-.34
One unit increase in condition of streets on a scale from 0 to 3	1.75	2.85
Must pass through bedroom to get from one room to another	-9.12	-3.46
Thermostat present	9.02	--
Building has more than two units and dwelling at least two exits to ground	--	7.91
Each story in building	1.75	-5.31
Off-street parking included in rent	5.02	4.55
One unit increase in amount of trash in streets on scale of 0 to 3	-.69	--
Each major appliance except stove and refrigerator included in rent	4.89	--
Each unit increase in quality of plumbing fixtures on a scale of 1 to 10	3.59	2.72
Amount added to gross monthly rent for each 100 square feet of floor space:		
All units	-3.64	-3.96
Age of building is between 1 and 4 years	4.03	--
Age of building is between 5 and 14 years	2.85	--
Age of building is between 1 and 14 years	--	7.47
Age of building is between 15 and 24 years	1.26	4.50
Age of building is between 25 and 34 years	1.20	1.38
Age of building is between 35 and 44 years	.55	.82

Table 3 (cont.)

Characteristics of Housing and Neighborhood	Amount Added to Gross Monthly Rent	
	Phoenix	Pittsburgh
Age of building is between 45 and 54 years	$ .00	$ .59
Age of building is more than 54 years	.00	.00
One unit increase in quality of floors, ceilings, and walls on a scale of 1 to 10	.75	.50
Landlord lives in building or immediate neighborhood	.03	-.56
Landlord is relative	-4.04	-1.91
Furniture included in rent	2.30	1.03
Each electrical outlet	--	.19
Building has more than two units	1.12	1.29
Each room	1.38	.49
Coefficient of determination	.69	.53
Number of observations	469	470

These equations are appropriate for predicting the market rents of leased public housing in New Haven in 1968 and Phoenix and Pittsburgh in 1973. However, we wish to predict the market rents of units in two of these cities and others in 1974. For this purpose, we needed cross-sectional and time-series indices of housing prices. The U.S. Bureau of Labor Statistics (BLS) produces such indices, but not for New Haven, Phoenix, and the cities in North Dakota. Furthermore, the BLS indices have several known biases. Although the same units are priced over time, the average quality of these units probably has been declining and, hence, the rate of inflation in housing prices is probably understated. Cross-sectionally the characteristics used to define identical housing are far from exhaustive. Units which are identical with respect to these characteristics are likely to be better in other respects in areas with higher-income families. As a result, BLS indices probably overstate housing prices in high-income areas relative to low-income areas.

The second part of our strategy for predicting the market rents of leased public housing units was to produce our own indices of housing prices which would allow us to use each equation to make predictions in all cities. To produce these indices, we asked the personnel in HUD Area Offices to collect data on the rent and characteristics of a small sample of unsubsidized housing units. We had hoped for 50 units in each city.

The way that we used these data to produce housing price indices is best explained with an example. Suppose that we wanted an index to show the difference in the price of identical housing between New Haven in 1968 and Chicago in 1974 and we wanted the index to have a value of one if there were no difference. We would substitute the characteristics of

each unsubsidized unit in Chicago in 1974 into the New Haven equation thus predicting how much these units would have rented for in New Haven in 1968. Our index is the ratio of the mean of the actual rents of these units in Chicago in 1974 to the mean of the predictions of what they would have rented for in New Haven in 1968. Unfortunately, we were not able to obtain data on unsubsidized units in all cities and we could not use all of the data collected because crucial questions were not answered in some cases. Our housing price indices along with the BLS indices are presented in Table 4. The numbers in parentheses are the numbers of observations on unsubsidized units on which our indices are based. The BLS indices involving New Haven, Phoenix, and the cities in North Dakota are based on the assumptions that housing prices are the same in New Haven and Hartford, Phoenix and San Diego, and the cities in North Dakota and the average of nonmetropolitan north-central cities, respectively.

To show how the numbers in this table are used, we continue with the preceding example. Suppose that we want to predict the market rent of a leased public housing unit in Chicago in 1974 using the New Haven equation. We substitute the characteristics of this unit into the New Haven equation to predict how much this unit would have rented for in New Haven in 1968 and then, to convert to 1974 Chicago prices, we multiply by either 1.411, our index, or 1.235, the BLS index.

This leads to the question of which index we chose in cases where we had a choice. In fact, we used four alternative sets of indices: (1) OURS where available, BLS otherwise; (2) OURS where based on more than 20 observations, BLS otherwise; (3) Means of OURS and BLS; and (4) BLS alone. The results relevant to policy making are insensitive

Table 4

Housing Price Indices

From	New Haven 1968		Phoenix 1973		Pittsburgh 1973	
To 1974	OURS	BLS	OURS	BLS	OURS	BLS
Boston	1.277 (32)	1.312	1.207 (32)	1.319	1.377 (32)	1.555
New Haven	1.359 (43)	1.229	1.334 (45)	1.258	1.365 (45)	1.484
New York	-- --	1.527	-- --	1.534	-- --	1.809
Pittsburgh	1.279 (15)	.878	1.006 (17)	.885	1.329 (17)	1.044
Atlanta	.839 (18)	.932	.671 (18)	.921	1.112 (18)	1.086
Orlando	-- --	1.113	-- --	1.119	-- --	1.319
Chicago	1.411 (11)	1.235	1.246 (2)	1.223	1.515 (4)	1.442
North Dakota	-- --	1.011	-- --	1.030	-- --	1.215
San Diego	1.246 (23)	1.068	1.048 (25)	1.052	1.037 (25)	1.241

Note: The BLS sample in New York City contains a substantial number of apartments subject to rent control. The BLS index for New York City was adjusted using estimates in Edgar Olsen's study of rent control so that it better measures rents in the uncontrolled sector.

to this choice and those reported are based on the first set of indices.

Finally, we had to decide which equation to use to make predictions in each city. In the cases of cities for which we had data on unsubsidized units, we chose the equation which when multiplied by the price index best predicted the actual rents of unsubsidized units. The New Haven equation is the best predictor of market rents for our sample of unsubsidized units in Boston and New Haven; the Phoenix equation for units in Pittsburgh (an outcome that we cannot explain), Atlanta, Chicago, and San Diego. Based on these results, it seemed best to use the New Haven equation for New York and the Phoenix equation for Orlando and cities in North Dakota. The mean prediction error of each equation in each city is presented in Table 5.

Empirical Results and Policy Implications

Since it is possible to reallocate funds among the variants of leased public housing, it is desirable to know the cost-effectiveness of these variants. The first part of this section is devoted to this issue. Within each variant of leased public housing, there are many ways of operating the program. The second part of this section presents results concerning how cost-effectiveness varies with parameters which can be controlled by HUD or the LHA.

Differences in Cost-Effectiveness by Program Type

Table 6 presents the cost-effectiveness measures for all cities combined and for each city separately. This table is based on only 698 of the 1155 units in our original sample because the information needed to estimate total cost and predict market rent was not reported in many cases. In estimating the ratios for all cities combined, the

Table 5

Mean Error in Predicting Monthly Rents of Unsubsidized Units Using Alternative Prediction Equations

City	Equation		
	New Haven	Phoenix	Pittsburgh
Boston	$40	$42	$44
New Haven	31	55	55
New York	-	-	-
Pittsburgh	34	24	55
Atlanta	7	6	19
Orlando	-	-	-
Chicago	22	12	16
North Dakota	-	-	-
San Diego	34	30	30

Table 6

Ratios of Mean Total Cost to Mean Market Rent of Leased Public Housing

City	Program Type		
	New	Existing	Rehab
All	.96	1.08	.99
Boston	.95	1.18	.98
	(26)	(24)	(32)
New Haven	1.17	1.13	--
	(17)	(50)	--
New York	.89	.94	.92
	(47)	(31)	(46)
Pittsburgh	--	1.39	1.35
	--	(67)	(1)
Atlanta	1.13	2.19	--
	(5)	(108)	--
Orlando	1.02	1.07	--
	(23)	(1)	--
Chicago	.81	.99	--
	(19)	(8)	--
North Dakota	.91	--	--
	(75)	--	--
San Diego	1.04	1.15	1.63
	(31)	(65)	(1)

Note: The numbers in parentheses are the numbers of observations upon which the ratios for individual cities are based.

total, rather than sample, number of units of each type in each city was used.

Looking at the cost-effectiveness ratios for all cities combined, it appears that the new and rehab variants of leased public housing are significantly more cost-effective than the existing variant. These results are misleading for several reasons.

First, our housing price indices may be rather inaccurate, leading to overestimates of market rents in some cities and underestimates in others. The underestimates may occur in cities which have a disproportionately large number of leased-existing units. We believe that Atlanta represents the most striking instance of this phenomenon. Our price indices indicate that housing prices in Atlanta in 1974 were two-thirds of housing prices in Phoenix a year earlier. Since we suspect that the use of this index results in underestimates of market rent in Atlanta and since fifty five percent of all leased units in this city are existing compared to only a third in other cities, we believe that the overall cost-effectiveness ratio for leased-existing public housing has been overestimated on this account.

Second, many of the units in our sample received subsidies from the various FHA or state housing programs.[9] These subsidies are not included in our measure of total cost. In our sample, a higher proportion of new and rehab units receive such subsidies.

Table 7 presents cost-effectiveness ratios based on units not affected by FHA or state programs. The cost-effectiveness advantage of new over existing units for all cities combined is much less than in the larger sample and the difference between existing and rehab disappears. Unfortunately, our restricted sample does not have enough observations

Table 7

Ratios of Mean Total Cost to Mean Market Rent of Leased Public Housing Excluding Units Under FHA or State Programs

City	Program Type		
	New	Existing	Rehab
All	1.02	1.06	1.06
Boston	--	1.18	1.08
	--	(24)	(8)
New Haven	1.17	1.12	--
	(17)	(43)	--
New York	1.02	.93	.96
	(2)	(29)	(19)
Pittsburgh	--	1.34	1.35
	--	(57)	(1)
Atlanta	--	2.13	--
	--	(43	--
Orlando	1.02	1.07	--
	(23)	(1)	--
Chicago	.86	.95	1.01
	(2)	(7)	(9)
North Dakota	.91	--	--
	(74)	--	--
San Diego	1.05	1.15	1.63
	(30)	(65	(1)

Note: The numbers in parentheses are the numbers of observations upon which the ratios for individual cities are based.

on each program type within individual cities to make many valid comparisons, and the two cities which do--New Haven and San Diego--produce conflicting results. Therefore, we are forced to conclude that there is little difference in the cost-effectiveness of the three variants of leased public housing.

Variation of Cost-Effectiveness with Program Parameters

This subsection reports an attempt to determine how cost-effectiveness varies with program characteristics which can be controlled by HUD or the LHA. In only a few cases can we confidently state in what direction the cost-effectiveness ratio changes with a change in a program parameter. Two explanations for these results come to mind. First, we have not obtained accurate enough data, especially concerning the costs and market rents of individual units, to allow us to discern the true relationship between cost-effectiveness and program parameters. Second, cost-effectiveness does not vary much with the program parameters considered. This would be an interesting result because it would imply that in making decisions concerning these parameters cost-effectiveness could be ignored. Unfortunately, we do not feel entirely confident in dismissing the first possibility.

Table 8 reports estimated relationships between the cost-effectiveness ratio and two types of variables. The variables for individual cities are included in an attempt to correct for inaccuracies in the measured cost-effectiveness ratio. The other variables are program characteristics subject to control by HUD or the LHA. To estimate these relationships, we used data on the leased public housing units in our sample for which we could calculate cost-effectiveness ratios

Table 8

Cost-Effectiveness Ratio as a Function of Program Characteristics

Program Characteristics	Amounts added to cost-effectiveness ratio with their standard errors of estimate in parentheses			
	Including FHA and State Units (1)	Excluding FHA and State Units		
		All Variants (2)	New and Rehab (3)	Existing (4)
All Units	1.001	1.116	1.143	1.084
Each ten unit increase in percentage of units leased by LHA in multiple dwelling	.041 (.006)	.005 (.009)	.000 (.009)	.003 (.013)
Unit is single family house	.337 (.070)	.130 (.091)	.160 (.096)	.102 (.133)
Family was living in unit before LHA leased it	.035 (.050)	.009 (.057)	-.003 (.063)	-.000 (.081)
Family found unit and called it to attention of LHA	-.033 (.047)	.025 (.058)	-.048 (.061)	.043 (.085)
Family found unit by other means excluding also LHA assignment	-.055 (.052)	-.076 (.075)	-.015 (.048)	-.089 (.140)
Family pays its portion of rent to landlord	.055 (.090)	.024 (.107)	-.013 (.097)	.014 (.159)
Landlord makes repairs	-.140 (.040)	.018 (.044)	-.051 (.037)	.055 (.069)
Each year unit has been leased under Section 23 program	.025 (.007)	-.001 (.008)	-.007 (.006)	.004 (.014)

Table 8 (continued)

Cost-Effectiveness Ratio as a Function of Program Characteristics

Program Characteristics	Amounts added to cost-effectiveness ratio with their standard errors of estimate in parentheses			
	Including FHA and State Units (1)	Excluding FHA and State Units		
		All Variants (2)	New and Rehab (3)	Existing (4)
Family has received counseling on finances or home economics before occupying unit	-.125 (.054)	-.069 (.057)	-.124 (.038)	-.010 (.097)
Unit built especially for the elderly	-.084 (.041)	.012 (.049)	.018 (.029)	.099 (.155)
Unit built especially for the program	-.202 (.044)	-.066 (.053)	-- --	-- --
Unit substantially rehabilitated especially for the program	-.247 (.056)	.003 (.075)	-- --	-- --
Unit under a state program	.002 (.062)	-- --	-- --	-- --
Unit under a FHA program	.182 (.037)	-- --	-- --	-- --
Unit located in New Haven	-.096 (.068)	-.023 (.090)	.077 (.080)	-.053 (.128)
Unit located in New York	-.162 (.104)	-.228 (.130)	-.071 (.115)	-.247 (.198)
Unit located in Pittsburgh	.029 (.081)	.196 (.103)	.302 (.162)	.222 (.154)

Table 8 (continued)

Cost-Effectiveness Ratio as a Function of Program Characteristics

Program Characteristics	Amounts added to cost-effectiveness ratio with their standard errors of estimate in parentheses			
	Including FHA and State Units (1)	Excluding FHA and State Units		
		All Variance (2)	New and Rehab (3)	Existing (4)
Unit located in Atlanta	.762	1.065	--	1.082
	(.076)	(.108)	--	(.159)
Unit located in Orlando	-.260	-.087	-.103	-.059
	(.100)	(.122)	(.083)	(.387)
Unit located in Chicago	-.137	-.152	-.174	-.151
	(.081)	(.115)	(.109)	(.175)
Unit located in North Dakota	-.289	-.188	-.206	--
	(.091)	(.112)	(.082)	--
Unit located in San Diego	-.136	.022	.038	.049
	(.070)	(.092)	(.074)	.138
Coefficient of determination	.75	.64	.41	.59
Number of cases	664	441	176	265

and for which the values of all explanatory variables were reported.

An estimated relationship based on all such cases is reported in the first column. Since the standard errors of estimate of many of its coefficients are small relative to the estimates of the coefficients, it appears that we can be confident concerning how cost-effectiveness varies with program parameters. Furthermore, many estimated coefficients are large, suggesting that how the program is operated makes a considerable difference. For example, it appears that it will cost about 33¢ (100 x 8 x .041) more for each dollar of housing services if the LHA rents all of the units in a building rather than only twenty percent of these units.

We believe that neither of these general conclusions is really supported by our data. About a third of the units underlying the estimated relationship in column 1 received subsidies under FHA or state housing programs. We do not know the magnitude of these subsidies and hence could not include them in the cost. Therefore, the cost-effectiveness ratio is underestimated in these cases. If the ratio of this additional cost to market rent were the same for all FHA units, then the inclusion of a dummy variable indicating whether the unit is under an FHA program would compensate for this measurement error. Similarly for units under state programs. Unfortunately, there are many different FHA and state programs, and even under one such program there is no reason to expect this ratio to be the same for all units. Since these programs may differ greatly in terms of the average values of the program parameters and the ratio of additional subsidy to market rent, the errors in measuring the cost-effectiveness ratio may be correlated with the program parameters, leading to large biases in estimating the effect

of these parameters on cost-effectiveness. For this reason, we believe that our most reliable results are obtained by excluding units under FHA and state programs. These results are reported in columns 2 through 4. The great differences between the coefficients in column 1 and 2 are consistent with the preceding argument.

Before discussing the results in column 2, we note an important result from the first estimated relationship. Even without adding the FHA subsidy, it appears to cost on average 18¢ more to provide a dollar's worth of housing services in FHA projects. That is, LHA's appear to pay significantly more for units in such projects than for comparable units that receive no other subsidies. Since the standard error of estimate of this coefficient is small relative to the estimate of the coefficient, this result provides strong evidence in support of the hypothesis that housing services are inefficiently produced under FHA programs such as Section 236 and Section 221(d)(3) which subsidize the housing of low-income families.

We will now discuss our estimates of the effects of program parameters on cost-effectiveness, based on units not in FHA or state projects. The numerical results mentioned in the discussion are taken from column 2. We attach little significance to the differences between the coefficients in columns 3 and 4 because they are small relative to their standard errors and we have no strong reason to expect differences having particular signs.

Percentage of Units Leased by LHA in Multiple Dwelling. We had thought that, if the LHA rents only a few of the apartments in a building, it would be unlikely to pay more for an apartment than unsubsidized families in the building pay for similar apartments. These rents are determined

by market forces. If the LHA rents all apartments in a building, this indirect discipline of the market is removed. Therefore, we expected the cost-effectiveness ratio to be higher for units in buildings with a high percentage of units leased by the LHA. The results are consistent with this expectation. They suggest that it will cost 4 cents more for each dollar of housing services if the LHA rents all of the units in a building rather than only twenty percent of these units. This result must be qualified in two ways. First, it seems reasonable to believe that LHA administrative cost will be less if a given number of units are located in a smaller number of buildings. If this is the case, then we have overestimated total cost for apartments in buildings with a high percentage of units leased by the LHA because we allocated administrative cost equally over all leased units in each city. As a result, we have probably overestimated the coefficient of this variable. Second, the standard error of estimate of this coefficient is so large that we cannot confidently rule out the possibility that the true cost-effectiveness ratio varies inversely with the percentage of units leased by the LHA. We conclude that cost-effectiveness provides no strong argument either for or against limiting the percentage of units that an LHA may lease in a building.

Single Family. Reasoning similar to that concerning the preceding variable led us to expect the renting of single family houses to be as cost-effective as renting all of the units in a multiple dwelling. The results suggest that it costs 8 cents [100(.130 - 10 x .005)] more for each dollar of housing services to rent a single family house rather than an apartment in a building where all of the units are rented by the LHA. Since we presume that it is more expensive to administer a leased public

housing program with N single family dwellings than with N apartments located in fewer than N buildings and since our estimated cost-effectiveness ratio was calculated on the assumption that the administrative cost is the same for all units in a city, we have overestimated the cost-effectiveness of single family units on this account. Given this bias, we are moderately confident that it is more cost-effective to rent an apartment in a building with few subsidized units than to rent a single-family house.

Methods of Obtaining Units and Assigning Families. Typically, local housing authorities rent units and assign families to them. The next three variables represent other methods of obtaining units for the program. Some people have argued that it is more cost-effective to let eligible families find their own apartments subject to a constraint on rent because the family would have more of an incentive than an LHA employee to find the best available unit renting for less than the maximum. Others have argued that the LHA employee would do better because he has superior bargaining ability and knowledge of the market. The coefficients reported in Table 8 show the cost-effectiveness of three alternatives compared with the typical method (i.e., the LHA finding and assigning families to a unit).

If the family was living in the unit before the LHA leased it or found the unit and called it to the attention of the LHA, we presume that the LHA incurs slightly less cost in searching for the unit. Hence, we believe that these estimated coefficients are probably too large. Since their standard errors of estimate are large, we conclude that there is no difference between the cost-effectiveness of these approaches to obtaining units and assigning families and the cost-effectiveness

of the typical approach. If this is true, then there is a good case for allowing families to find their own units. Apartments with the same market rent differ greatly with respect to their characteristics. For this reason, a family will not be indifferent among all units with the same market rent. Under a finders-keepers policy, a family eligible for leased public housing can choose from among all vacant units in a certain rent range and will usually be better off and never be worse off than if it is arbitrarily assigned to one of these units.

In some cases, welfare and urban renewal agencies find apartments for families eligible for leased public housing. These are the principal other means referred to in Table 8. Since the cost incurred by these agencies is not included in our measure of total cost, our results probably make this method appear more cost-effective than it is. Since the standard error is large, we cannot be confident that this method is more cost-effective than the typical method and, in any event, HUD and the LHA can do little to stimulate its use.

Responsibility for Collecting Rent. In some cases the landlord is responsible for collecting rent from the tenant. In other cases the LHA collects rent from the tenant and pays the full rent to his landlord. Landlords undoubtedly charge a greater total rent in the former case because greater effort is required of them, and we know this amount. The LHA undoubtedly incurs a greater administrative cost on behalf of families in the latter case. However, we were forced to assume that administrative cost is the same in both cases. Thus, our results will probably make landlord collection of the rent appear less cost-effective than it is. Table 8 indicates that landlord collection of rent is slightly cost-ineffective. However, taking account of the bias and the substantial

standard error, we conclude that this variable has no perceptible effect on the cost-effectiveness ratio.

Responsibility for Maintenance and Repairs. In some cases employees of the LHA make repairs on leased public housing units. In other cases landlords make the repairs.[10] The results in Table 8 suggest that it costs slightly more for each dollar of housing service if the landlord makes repairs. However, since the standard error of estimate is so large, we conclude that maintenance responsibility has no perceptible effect on cost-effectiveness.

Years in the Leased Public Housing Program. It has been conjectured that after a unit enters the program its owner will allow the unit to deteriorate more rapidly than otherwise because he realizes that a subsidized family will not move as quickly as an unsubsidized family in response to the decreased maintenance and that the LHA will not monitor the condition of the unit as closely as an unsubsidized occupant would monitor it. As a result, market rent falls over time relative to the rent received by the owner. The evidence in this study does not support this hypothesis. The estimated coefficient is essentially zero and is probably biased upward since it surely costs less to renew a contract than to initiate a new one.

Counseling. Table 8 suggests that families that receive counseling on finances or home economics experience a lower ratio of cost to market rent. Unfortunately, our method of calculating total cost biases the result in this direction because we spread the entire LHA cost of counseling evenly over all units in the city. Since LHA expenses on counseling are not listed separately on the Statement of Operating Receipts and Expenditures, we cannot do what we did for LHA maintenance expenses, namely,

allocate to each family that received counseling an equal share of LHA expenses on this item. Furthermore, the LHA probably does not provide all of the counseling reported and the cost incurred by other agencies is not included in our measure of total cost. Due to the direction of bias and the size of the standard error, we conclude that counseling does not have an important effect on cost-effectiveness.

Units Built for the Elderly. Table 8 indicates that units in buildings built especially for the elderly are slightly more cost-effective than units in other buildings. In this case, there are perhaps offsetting biases. On the one hand, such units contain a few special features which would add to true market rent but which are not captured by our prediction equations. On the other hand, the elderly may be regarded as particularly desirable tenants and, in the private market, pay less than others for identical housing. If so, then we have overestimated market rent on this account. Since the standard error of estimate is large, we are inclined to believe that buildings built especially for the elderly have no particular advantage on cost-effectiveness grounds.

Program Type. The three types of leased public housing differ with respect to the average values of the preceding variables. The next two coefficients show the difference in cost-effectiveness of new and rehab compared to existing on account of all other ways in which these program types differ. The results suggest that there is essentially no difference between the cost-effectiveness of the rehab and existing variants attributable to the combined effect of all of these other differences between the programs but that new is more cost-effective than existing on these accounts. Care should be taken in deriving policy implications from the latter result which may be restated as follows. If a new leased public

housing program were operated in the same way as a leased existing program with respect to all of the preceding variables and both were operated as at present with respect to all other variables, then new would cost 6.6 cents less than existing for each dollar's worth of housing services. However, the standard error of this coefficient is large enough that there is a non-negligible possibility that existing is more cost-effective than new.

Cities. The remaining coefficients indicate the difference between the measured cost-effectiveness ratio in Boston and that in the other eight cities, after taking account of the effects of the other variables. It is tempting to interpret these coefficients as reflecting differences in managerial efficiency. However, we believe that these coefficients also capture three other influences on the measured cost-effectiveness ratio. First, the city variables correct for inaccuracies in the price indices used in predicting market rent. For example, we believe that the Atlanta coefficient is so large because we have underestimated market rents in this city. Second, the city variables take account of differences in administrative cost attributable to differences in the number of units under each of the variants. Third, the differences may be explained in part by differences in LHA accounting methods, specifically, the way that they allocate expenses between the leased and LHA-owned public housing programs. Since these coefficients capture at least three other factors, nothing about managerial efficiency alone can be inferred from their relative magnitudes.

Footnotes

1. See Henry Aaron for a good introduction to publicly subsidized housing.

2. During the first part of this period the units were under the Section 23 leased housing program while during the latter part the units were under the new Section 8 program of the Housing and Community Development Act of 1974.

3. See U.S. Department of Housing and Urban Development (pp. 126-127).

4. Ibid.

5. Ibid., p. 117.

6. Such relationships are playing an increasingly important role in economic analyses of government housing programs. See, for example, the studies by Edgar Olsen, Michael Murray, and John Kraft and Edgar Olsen.

7. In retrospect, given the amount of money spent on these programs, this may have been false economy.

8. We are indebted to Tom King for estimating the equation reported in Table 2.

9. For leases signed prior to November 1973, the LHA's paid "market rents" for units in Section 236 projects. HUD defines market rent as the sum of operating expenses,amortization of that portion of the mortgage associated with the unit at the FHA ceiling interest rate, and the mortgage insurance payment. Therefore, sample units in such

projects received no additional subsidy under the 236 program unless the FHA interest ceiling was below the market interest rate and the project received an additional subsidy under the GNMA Tandem Plan. We are grateful to Joseph Malloy for bringing this matter to our attention.

10. This discussion concerns who makes the repairs, not who pays for them.

References

Aaron, Henry J. Shelter and Subsidies. Washington, D.C.: Brookings Institution, 1972.

King, A. Thomas, and Mieszkowski, Peter. "Racial Discrimination, Segregation, and the Price of Housing," Journal of Political Economy, LXXX (May/June 1973), 590-606.

Kraft, John,and Olsen, Edgar O. "The Distribution of Benefits from Public Housing." In The Distribution of Economic Well-Being, edited by F. Thomas Juster. New York: Columbia University Press, forthcoming.

Murray, Michael P. "The Distribution of Tenant Benefits in Public Housing." Econometrica, XLIII , July 1975, 771-788.

Olsen, Edgar O. "An Econometric Analysis of Rent Control." Journal of Political Economy, LXXX , November/December 1972, 1081-1100.

U.S. Department of Housing and Urban Development. Housing in the Seventies: A Report of the National Housing Policy Review. Washington, D.C.: U.S. Government Printing Office, 1974.