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OPERATING EXPENSES IN PUBLIC HOUSING, 1968-71

Frank de Leeuw

assisted by

Sue A. Marshall

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DEPARTMENT OF HOUSING
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209-5-1 October 1973



THE URBAN INSTITUTE
WASHINGTON, D.C.

The research forming the basis for this paper was funded by the U.S. Department of Housing and Urban Development. Opinions expressed are those of the author(s) and do not necessarily represent the views of The Urban Institute or its sponsors.

UI 209-5-1

ISBN 87766-106-5

REFER TO URI - 57000 WHEN ORDERING.

Available from:

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2100 M Street, N.W.
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List price: \$2.00

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A b s t r a c t

This study analyzes operating expenses of 337 local housing authorities (LHA's) during the years 1968 to 1971. The results of the study enable a reader to determine how the level and rate of change of a particular LHA's operating expenses compare with what we might expect on the basis of its location, local wage levels, and certain characteristics of its housing units. The study does not describe or recommend any course of action once an authority's expenses have been evaluated in this way. Analysis of this kind, however, can obviously be a first step in an attempt to influence operating expense levels.

The study complements and updates a number of earlier studies of operating expenses in multi-family housing.

After an introduction and summary, there are two analytical sections in the study. One is a multiple regression analysis of 1970-71 levels of total operating expenses per unit per month in relation to characteristics of localities and LHA's. The second is a tabulation and analysis of rates of change of total operating expenses in 1968-69, 1969-70, and 1970-71. The second section concludes that while in 1968-69 general inflation probably accounted for the great bulk of the rise in operating expenses, by 1970-71 expenses were rising appreciably faster than might be expected on the basis of general inflation.

Two appendices to the study extend the analysis to some major components of operating expenses.

C o n t e n t s

	<u>Page</u>
Abstract	iii
I. Introduction and Summary	1
Background of the Study	2
The Sample of Housing Authorities	4
Summary of Findings	5
II. Levels of Operating Expense, 1970-71	9
Total Operating Expenses in 1970	10
Levels of Operating Expenses in 1971	16
Differences between Actual and "Predicted" Expenses	19
III. The Rate of Change of Operating Expenses	23
Rates of Change by Size, Location, and Region	24
Comparison with Measures of General Inflation	27
Appendices:	
A. The Components of Operating Expense Levels	33
B. The Components of Operating Expense Changes	36
C. Sources of Data	39

T a b l e s

<u>Table</u>		<u>Page</u>
1	Mean Rental Receipts and Operating Expenses, 337 Housing Authorities, 1970	6
2	Regression Analysis of Total Operating Expenses Per Unit Per Month, 337 Housing Authorities, 1970	11
3	Regression Analysis of Total Operating Expenses Per Unit Per Month, 310 Housing Authorities, 1970	17
4	Regression Analysis of Total Operating Expenses Per Unit Per Month, 310 Housing Authorities, 1971	18
5	Rates of Change of Total Operating Expenses Per Unit Per Month, 288 Housing Authorities, 1968-71 ..	25
6	Percent Changes in Annual Earnings Per Full-Time Employees by Industry	28
7	Regression Analysis of Components of Total Operating Expenses (PUM), 337 Housing Authorities, 1970	34
8	Percent Changes in Six Components of Operating Expenses, 288 Housing Authorities, 1970-71	37

I l l u s t r a t i o n s

<u>Chart</u>		<u>Page</u>
1	Residuals between Actual and Predicted Expenses, 1970	20

I. INTRODUCTION AND SUMMARY

This study analyzes operating expenses of local housing authorities (LHA's) during the years 1968 to 1971. The results of the study enable a reader to determine how the level and rate of change of a particular LHA's operating expenses compare with what we might expect on the basis of its location, local wage levels, and certain characteristics of its housing units. The study does not describe or recommend any course of action once an authority's expenses have been evaluated in this way. Analysis of this kind, however, is obviously one element in any effort to influence operating cost levels.

The study has important limitations. Most of them arise from the fact that the list of variables considered in the study is seriously incomplete. Because of the pressure of time, the list includes essentially those factors for which local information is readily available. It does not contain any direct measure of the performance or output of a housing authority. Nor does it attempt to measure the management characteristics of an authority. Further work extending the data base of the present study may remedy some of these defects. Until the defects are remedied, conclusions based on the study should be taken as tentative.

The study is also restricted to dwellings owned by housing authorities and hence omits leased housing. The reason for this omission is that the factors which affect leasing costs differ in obvious respects from the ones which affect authority-owned costs. Land and construction costs, property taxes, and housing market tightness all have a much more direct impact on

leasing costs than they do on operating costs for authority-owned projects. To be of any practical use, an analysis of leasing costs would have to taken account of these factors.

BACKGROUND OF THE STUDY

Current interest in the cost of operating public housing projects stems from the increasing number of local housing authorities which find themselves in serious financial difficulty. The traditional system of financing public housing, under which the federal government paid for the land and the buildings while the tenants (through their rents) paid for maintenance, utilities, administration, and other operating costs, began to function poorly for a significant number of LHA's in the mid-1960's. Two long-term trends contributed to this breakdown in the traditional system. One was the tendency for public housing tenants to be drawn from an increasingly lower portion of the income distribution so that the rent-paying ability of the tenants grew very slowly. The other was the tendency of operating expenses per unit to rise over time as prices and wages in the economy generally rose. The expense trend "crossed" the rent trend for many LHA's in the 1960's.

Since then, a number of legislative provisions have extended federal subsidies to LHA operating expenses. They have provided operating subsidies for elderly households, large families, and certain other classes of tenants. They have provided supplemental appropriations to cover certain LHA deficits. And in the Housing Act of 1969 and 1970, they have put ceilings on rents in relation to incomes and provided for operating subsidies on a fairly broad basis. These legislative provisions have made money available

to meet the gap between operating expenses and rents, but they have not narrowed the gap.

In the design of measures to control or narrow the gap rather than simply finance it, there are important dangers to avoid. On the expense side, the danger of too strict control is a reduction of the housing services that LHA's provide. On the rent side, the danger is systematic exclusion of households with the lowest rent-paying ability--those who need a housing subsidy the most. It should be possible, however, to modify the underlying trend of expenses to the point of considerable cost savings without incurring these disadvantages.

The present study is one step toward an effort to reduce the gap by controlling the operating expense side of the financial equation. It is a preliminary step, for reasons already mentioned; but it is a step on which future efforts can build. Other HUD and Urban Institute efforts are directed to the longer-term goal of improving the management of low- and moderate-income housing.¹ Improved management can have a major impact on expense in addition to its other obvious benefits.

The present study builds on a number of earlier ones. The first of these, Operating Costs in Public Housing: A Financial Crisis,² analyzed the financial experience of 23 big-city LHA's during 1965-68. The present study extends the earlier one in time and in coverage, by starting with the year in which the earlier study ended and by analyzing the experience of a random sample of all housing authorities rather than large central-city

¹See "Management Performance in Multi-Family Housing Developments," by Robert Sadacca and Morton Isler, No. 209-4 (Washington, D.C.: The Urban Institute, 1972).

²Frank de Leeuw, Operating Costs in Public Housing: A Financial Crisis, No. 8-112-11 (Washington, D.C.: The Urban Institute, 1970).

authorities only. A cost of extending the earlier work in this way is that there is not as much data available for each housing authority and location in the present study as in the earlier one.

There are three other recent studies of operating expenses in multi-family housing. One of them is a study by C. Peter Rydell of maintenance and operating expenses of public housing projects in New York City.³ A second is an Urban Institute analysis of a random sample of FHA subsidized housing projects.⁴ The third is a study of unsubsidized rent-controlled apartments in New York City which distinguishes between a group of "high payroll" buildings and a group of "low payroll" buildings.⁵ These studies emphasize many of the same influences on operating expenses as the present study.

THE SAMPLE OF HOUSING AUTHORITIES

The study is based on a sample of 337 housing authorities. Authorities outside the United States or on Indian reservations and authorities not submitting financial reports for 1970 were excluded in selecting the sample. Apart from these exclusions the sample includes all authorities with more than 1,000 authority-owned units under management as of 1970 and a 15 percent random sample of all remaining authorities. The 15 percent sample is stratified by region and size-class.

³C. Peter Rydell, Factors Affecting Maintenance and Operating Costs in Federal Public Housing Projects, No. R-634-NYC (New York: The Rand Corporation, 1970).

⁴Sam H. Leaman, Robert Sadacca, and Morton L. Isler, "The Prediction and Comparison of Insured Housing Program Expenses," No. 209-2-1 (Washington, D.C.: The Urban Institute, 1972).

⁵Karen M. Eisenstat, Factors Affecting Maintenance and Operating Costs in Private Rental Housing, No. R-1055-NYC (New York: The Rand Corporation, 1972).

Some of the financial characteristics of the sample are immediately evident on inspection of Table 1. Expenses per unit per month are high in the Northeast and low in the South (as compared to other regions), expenses are higher in large LHA's than in small ones, and expenses are slightly higher in central-city LHA's than in suburban or nonmetropolitan LHA's. Rent differences tend to follow expense differences but are not as extreme. The 1970 difference between rents and operating expenses (almost all of which is accounted for either by HUD subsidies or by LHA residual receipts) ranges from an average monthly deficit of more than \$9 in large central-city LHA's in the Midwest and West to an average monthly surplus of \$3 in small noncentral central-city LHA's in the South. The range of differences among individual housing authorities is of course much wider than the ranges shown in the table. The table merits close attention, however, since it foreshadows some of the underlying themes of this report.

SUMMARY OF FINDINGS

The next section of this report develops statistical relationships between total operating expense per unit per month and major characteristics of localities and their housing authorities. The section analyzes total operating expenses per unit only. An appendix applies the same methodology to six major components of operating expense.

The factors analyzed include locational variables such as central-city location and region, one economic variable reflecting local labor market conditions, and two housing authority variables measuring the size and the elderly proportion associated with each authority. These three groups of factors all have important effects on housing authority expenditures. A number of other factors, such as the average project size or the turnover

Table 1

MEAN RENTAL RECEIPTS AND OPERATING EXPENSES, 337 HOUSING AUTHORITIES, 1970

Region and Central-City Location	Large LHA's (over 1,000 units)			Small LHA's (less than 1,000 units)				
	Number	Rental Receipts (\$ per unit per month)	Operating Expenses (\$ per unit per month)	Rent Less Expenses	Number	Rental Receipts (\$ per unit per month)	Operating Expenses (\$ per unit per month)	Rent Less Expenses
Northeast (HUD Regions 1-3) Central-City Location	32	\$58.29	\$65.61	\$-7.32	7	\$54.00	\$55.99	\$-1.99
Noncentral-City Location	12	58.83	60.52	-1.69	23	55.85	55.94	- .09
South (HUD Regions 4, 6) Central-City Location	27	37.82	42.59	-4.77	6	34.86	36.89	-2.03
Noncentral-City Location	12	36.88	41.88	-5.00	133	34.09	31.10	+2.99
Rest of U.S. (HUD Regions 5, 7-10) Central-City Location	25	49.53	59.11	-9.58	5	48.26	46.93	+1.33
Noncentral-City Location	8	49.88	56.44	-6.56	47	42.45	40.15	+2.30

Note:

All large LHA's (subject to qualifications mentioned on pages 2-3) are included in the sample, and hence there is no sampling error associated with their financial data. The small LHA's constitute a random sample of 15 percent of all eligible authorities. Sampling errors associated with operating expenses for small LHA's are approximately \$12.75 divided by the square root of the number of LHA's in each category. Thus, for small LHA's located in a central city in the South, where the sample size is 6, the sampling error for operating expenses is \$12.73 divided by 2.45 (the square root of 6), or \$5.20. For small LHA's located outside a central city in the South, where the sample size is 133, the sampling error for operating expenses is \$12.75 divided by 11.53, or \$1.10. Sampling errors for rental receipts are slightly smaller than for operating expenses, while sampling errors for rent-less-costs are only 10 or 20 percent of sampling errors for operating expenses.

rate associated with an LHA, were tested but appear not to have a significant relationship to expenses.

The section concludes with a comparison of actual with "calculated" or "predicted" expenses for the 337 sample authorities. The resultant discrepancies or residuals would be the starting point in any attempt to use these results to evaluate the financial components of a housing authority. Authorities whose actual expenses exceeded "calculated" expenses by more than some specified amount might, for example, be singled out for special attention or treatment.

Following the section on operating cost levels is a section which focuses on rates of change of operating expenses from 1968 to 1971. The section first summarizes rates of change for various groupings of housing authorities in the sample. It then compares these rates of change with some general indicators of inflation in the economy.

The results of the section indicate that rates of change of operating expenses have generally moved upward between 1968-69 and 1970-71. Changes in 1968-69 were almost certainly largely due to general inflation; but by 1970-71 other factors besides general inflation probably accounted for a substantial fraction of cost increases.

The rates of change in this section, like "predicted" levels of the previous section, can be used in developing guidelines for evaluating housing authority finances. Housing authorities with rates of change per-unit expenses above those for the subgroup of authorities to which they belong, for example, might be singled out for special attention.

Three appendices complete the study. The first analyzes six components of total operating expenses using the same explanatory variables as the section on total cost levels. The second presents tabulations of rates of change of six components of total operating expenses from 1970 to 1971. The third lists the LHA's in the sample and the sources of data.

II. LEVELS OF OPERATING EXPENSE, 1970-71

This section presents statistical relationships between total operating expense per unit in a housing authority (omitting leased units) and three kinds of explanatory variables. The first kind consists of locational variables which describe the region, rural or urban character, and population of the locality in which a housing authority operates. The second kind consists of a single variable, the average local wage rate of municipal employees, which reflects the economic conditions facing a housing authority in the local labor market. The third kind consists of two housing authority characteristics--number of units under management and the proportion of units occupied by elderly households.

The reader is cautioned that the analysis in this chapter is based on data derived from a complete sample of the 116 largest LHA's and a 15% random sample, amounting to 221 observations of all the remaining LHA's. Means or variances based on the combined sample may not be representative of all LHA's.

This section analyzes only total operating expenses. Exactly the same methodology, however, can be applied to the components of operating expense. The first appendix to this paper presents statistical relationships for six major components of operating expense.

The variables in the analysis of this section include only those which are readily available and therefore fail to include many of those which we might expect to be important. In the abstract, we might expect the average cost per unit of a housing authority to depend on the services it is providing, the efficiency with which it is providing those services, and the local

constraints under which it is operating. The variables in the present analysis do not include any direct measures of services provided (although the proportion of elderly households in an authority provides some clue as to the nature of the services). Nor do the included variables measure the efficiency with which an LHA is managed. Many of the constraints facing a housing authority are reflected in the included variables; but even here there are important gaps.

The variables included in the analysis, as we shall see, account for a good deal of the variation in expense levels among authorities. Probably this high proportion of explained variance results partly from correlation of the included variables with the variables omitted from the analysis--for example, of size (an included variable) with some dimensions of management style (omitted variables). The high proportion of explained variance does not, however, mean that residuals between actual and "calculated" expense levels are equal to or even close to zero. There are sizeable residuals for many LHA's, presumably reflecting differences in services provided and in the efficiency with which they are provided.

TOTAL OPERATING EXPENSES IN 1970

The variables included in this analysis, as already mentioned, can be classified into locational, economic, and housing-authority variables. Table 2 presents the results of three multiple regressions. The first (columns 1 and 2) relates total cost per dwelling unit per month to locational variables only--variables over which a housing authority has no control. The second (columns 3 and 4) add an economic variable, the local wage level for municipal employees--a variable over which an LHA has no direct control but which is determined in a bargaining process similar to wage negotiations in which many LHA's engage. The third (columns 5 and 6) regression adds to the second set housing-authority variables over which LHA's do have some control.

Table 2

REGRESSION ANALYSIS OF TOTAL OPERATING EXPENSES PER UNIT PER MONTH,
337 HOUSING AUTHORITIES, 1970

	Location Variables Only		Location & Economic Variables		Location, Economic & LHA Variables	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant Term	52.94	39.3	21.60	4.8	28.82	6.4
Location Variables						
Non-SMSA Location (1-0)	-17.00	11.9	- 8.96	3.4	- 3.93	1.6
Suburban Location (1-0)	- 8.13	4.8	-10.19	6.5	- 4.92	3.1
Place Population (non-SMSA only, 000)	.342	5.1	.349	5.6	.244	4.1
Region 1 (Boston)	9.04	3.7	7.13	3.1	9.67	4.6
Region 2 (New York)	17.59	8.0	14.15	6.8	14.43	7.5
Region 3 (Philadelphia)	8.29	3.9	10.64	5.5	7.67	4.2
Region 4 (Atlanta)	- 7.02	4.9	- 3.06	2.2	- 5.91	4.3
Region 6 (Fort Worth)	-11.30	6.9	- 7.25	4.6	- 9.96	6.6
Region 9 (San Francisco)	11.88	4.4	6.03	2.4	5.01	2.1
Economic Variable						
Average Monthly Wage, "common municipality functions"			.054	7.4	.038	5.6
Wage Data Absent (1-0)			20.33	4.4	14.86	3.5
Housing Authority Variables						
Elderly Proportion					-12.23	4.8
Elderly Data Absent (1-0)					-11.08	2.6
Number of Units (000)					1.41	5.6
Square of Number of Units (000) Reporting Quarter (1-4)					- .016	4.2
					1.004	2.6
R ²	.67		.72		.77	
Standard Error of Estimate	\$9.23		\$8.40		\$7.71	

The first coefficient in the first column of the table, \$52.94, represents "calculated" total operating expenses per unit per month (PUM) in 1970 for a housing authority in the following situation: (1) in a central city and (2) in HUD Regions 5, 7, 8, or 10 (that is, in mid-western or western regions except for California). The remainder of the first column of Table 2 describes the influence of departures from this set of locational characteristics. The second coefficient in the table indicates that the "calculated" effect of being outside a Standard Metropolitan Area was to lower operating expenses per unit per month by \$17.00. The third coefficient indicates that the "calculated" effect of being inside an SMSA but in a suburban rather than in a central-city location was to lower operating expenses by \$8.13. The fourth coefficient indicates that among those authorities outside metropolitan areas the population of the city or town in which they are located was associated with some variation in operating expenses--specifically, an increase of \$.34 for each additional thousand of population.

The remaining six coefficients in the table indicate the effect of location in different HUD regions on average operating expense per unit in 1970. Regions 1, 2, and 3--the three northeastern regions--are associated with higher-than-standard operating expense in amounts ranging from \$8 to \$17. Regions 4 and 6--the two southern regions--are associated with lower-than-standard operating expenses by \$7 and \$11 respectively. Finally, Region 9--the California region--is associated with a higher-than-standard expense level.

The variables in Table 2 include explicitly only six of the ten HUD regions. The reason is that the other four did not have coefficients which were significantly different from zero. The same was true of the three-year

average January temperature in each location. Its effect, once the regional variables were introduced, was very close to zero and not significant by statistical tests. Without the regional variables there was a strong association between total expense and average temperature; but apparently the regional variables captured geographic differences in cost more successfully than average temperature.

Probably the regional variables measure other factors in addition to differences in climate. Wage differences among regions are one such factor; for as we shall see, the coefficients of most of the regional variables decline when local wage rates appear explicitly in the regression. Average age of the public housing stock may well be another such factor. Differences in building type and differences in HUD regional office administrative practices are other possibilities.

The third column of Table 2 adds to the first-column variables a measure of the average local wage rate of municipal employees in each housing authority location. Wage rates evidently have a close association with cost levels, since the measure of overall goodness of fit is appreciably higher for column 2 than for column 1. The coefficient of the wage variable in column 2, \$.054, implies that the "calculated" operating cost per unit per month goes up by a little over five cents for each dollar increase in the average monthly wage. Wage data are not available for many of the small nonmetropolitan localities in the sample and so a variable indicating the absence of wage information is included for the remaining authorities. The coefficient of this variable indicates that where wage information is missing

an average "wage effect" of \$20.33 per unit per month best fills the information gap.⁶

It is worth noting that introducing the wage variable changes a number of the other coefficients in the analysis significantly. It reduces the effect of the variables indicating nonmetropolitan area and suburban location, suggesting that a large proportion of the variance which these factors were capturing in the first regression is accounted for by wage differences between cities, suburbs, and nonmetropolitan areas.

The wage variable in the analysis does not depend directly on the wages which local housing authorities pay, since local housing authority employees are not counted in the "common municipal functions" which the variable covers. The wage rate does, of course, reflect negotiations and contracts with many of the same types of unions which organize the staffs of housing authorities. Housing authority negotiations, however, are generally a small part of the overall labor negotiation picture and there does not seem any possibility of significant statistical distortion from including the local municipal wage rate among the variables in the analysis.

The fifth column of Table 2 includes characteristics of housing authorities in addition to the variables in the second column. Once again, the overall goodness of fit improves significantly and coefficients of other variables change.⁷ The first LHA characteristic, the proportion of units occupied by elderly households, has a significant negative association with

⁶ If the wage coefficient of \$.054 is assumed to apply to these localities where information is missing, then the "wage" effect of \$20.33 implies that the average wage in these localities must be \$377.

⁷ The t-ratio for one variable, non-SMSA location, drops below 2.0 (the threshold often used to define "statistically significant") in this third regression.

total operating expense per unit. The coefficient in Table 2 implies that an elderly household is associated with a "calculated" operating expenditure per month \$12.33 smaller than a nonelderly household. This coefficient reflects the physical characteristics of units for the elderly (e.g., small number of rooms) as well as the behavioral characteristics of elderly persons. As in the case of the wage variable, the elderly variable is not available for all of the authorities in the sample (though the number of cases in which it is missing is quite small) and so a variable indicating the absence of elderly information is also included in the table.

The next two LHA variables measure the number of units and the square of the number of units under management in an authority, with number of units being expressed in thousands. The coefficients of these variables together suggest that average operating expense per unit rises as the number of units rise, but by a gradually-declining amount. They imply that small housing authorities have lower average expenses than large housing authorities even after taking account of region, metropolitan or nonmetropolitan location and local wage rate.

The final variable refers to the quarter in which the fiscal year of each authority ends. The coefficient of this variable indicates that those authorities reporting in the second quarter have an average operating expense per unit \$.91 greater than those reporting in the first quarter; and similarly for the difference between each succeeding pair of quarters.

Two additional LHA variables were tried but had no significant effect in this statistical analysis of expenses and were dropped from the analysis. These were the vacancy rate and the average number of dwellings per project in an LHA. A third variable, the turnover rate in an LHA, did have a statistically significant effect on expenses but its coefficient was negative,

implying that higher turnover lowers costs. Because a negative effect of turnover on expense did not seem plausible, this variable was also dropped from the analysis.

LEVELS OF OPERATING EXPENSES IN 1971

The analysis of operating expense levels for 1971 follows exactly the same procedure as the analysis for 1970. Hence a much shorter account of the 1971 findings will suffice.

Because of the absence or partial absence of data for some 25 of the sample LHA's, the 1971 analysis refers to a smaller sample than the results discussed above for 1970. Furthermore, the housing authority variables (elderly proportion and number of units) refer to 1970 even for the 1971 analysis, since 1971 data were only partially available at the time the analysis was conducted. To permit comparability of 1970 results and 1971 results, there is a table (Table 3) re-doing the 1970 analysis but based on only those authorities for which 1970 and 1971 data were fully available. The 1971 results, shown in Table 4, should be compared with the reduced-sample results in Table 3 and not with the full-sample results in Table 2.

Results for 1971 are broadly similar to those for 1970. For none of the explanatory variables is the sign of a coefficient different in 1971 than in 1970. All of the qualitative conclusions about 1970 drawn above carry over to 1971 as well.

One difference between 1970 and 1971 is that the standard error of estimate in the explanation of total operating expenses per unit is greater in the later year. Whereas in 1970 the average deviation of actual from "predicted" expense was \$6.97, in 1971 the corresponding figure was \$8.54. In part this difference reflects the fact that there was more variation in

Table 3

REGRESSION ANALYSIS OF TOTAL OPERATING EXPENSES PER UNIT PER MONTH,
310 HOUSING AUTHORITIES, 1970

	Location Variables Only		Location & Economic Variables		Location, Economic & LHA Variables	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant Term	53.16	40.1	20.30	4.8	27.61	6.4
Location Variables						
Non-SMSA Location (1-0)	-17.13	12.4	- 7.06	2.7	- 2.42	1.0
Suburban Location (1-0)	- 8.06	4.9	-10.22	7.0	- 4.90	3.3
Place Population (non-SMSA only, 000)	.320	4.7	.317	5.2	.234	4.1
Region 1 (Boston)	8.73	3.6	6.63	3.1	8.89	4.5
Region 2 (New York)	18.20	8.4	14.47	7.4	14.56	8.2
Region 3 (Philadelphia)	8.52	4.0	10.70	5.6	7.39	4.2
Region 4 (Atlanta)	- 7.71	5.5	- 3.23	2.4	- 6.06	4.6
Region 6 (Fort Worth)	-11.02	7.0	- 6.38	4.3	- 9.21	6.4
Region 9 (San Francisco)	10.68	3.9	3.20	1.3	3.36	1.4
Economic Variable						
Average Monthly Wage, "common municipale functions"			.056	4.3	.040	6.2
Wage Data Absent (1-0)			19.21	8.2	13.25	3.2
Housing Authority Variables						
Elderly Proportion					-10.25	4.2
Elderly Data Absent (1-0)					-14.08	3.2
Number of Units (000)					1.39	6.1
Square of Number of Units (000)					- .016	4.8
Reporting Quarter (1-4)					.908	2.5
R ²	.68		.76		.81	
Standard Error of Estimate	\$8.84		\$7.78		\$6.97	

Table 4

REGRESSION ANALYSIS OF TOTAL OPERATING EXPENSES PER UNIT PER MONTH,
310 HOUSING AUTHORITIES, 1971

	Location Variables Only		Location & Economic Variables		Location, Economic & LHA Variable	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant Term	56.99	37.3	26.99	4.9	39.73	7.3
Location Variables						
Non-SMSA Location (1-0)	-19.16	11.7	- 9.44	2.9	- 3.09	1.0
Suburban Location (1-0)	- 9.68	5.0	-11.82	6.4	- 4.22	2.3
Place Population (non-SMSA only, 000)	.033	4.2	.331	4.4	.225	3.2
Region 1 (Boston)	16.47	5.6	15.22	5.6	17.21	7.5
Region 2 (New York)	21.31	8.4	17.68	7.2	17.71	8.1
Region 3 (Philadelphia)	10.62	4.2	13.02	5.4	8.33	3.7
Region 4 (Atlanta)	- 7.49	4.5	- 3.15	1.8	- 7.12	4.3
Region 6 (Fort Worth)	-11.37	6.1	- 6.60	3.4	-10.43	5.7
Region 9 (San Francisco)	14.15	4.4	8.22	2.6	8.96	3.1
Economic Variable						
Average Monthly Wage, "common municipality functions"			.048	5.8	.024	3.1
Wage Data Absent (1-0)			16.87	3.0	6.81	1.3
Housing Authority Variables						
Elderly Proportion					-12.74	4.3
Elderly Data Absent (1-0)					-14.01	2.6
Number of Units (000)					2.01	7.1
Square of Number of Units (000) Reporting Quarter (1-4)					-.021	5.4
					.571	1.2
R ²		.68		.72		.78
Standard Error of Estimate		\$10.38		\$9.68		\$8.54

expenses among the sample housing authorities in 1971 than in 1970. In part, the difference reflects the fact that proportion of explained variance was somewhat smaller in the later year.

DIFFERENCES BETWEEN ACTUAL AND "PREDICTED" EXPENSES

To use the results of the preceding analysis to evaluate the financial experience of an individual LHA, the first step is a comparison of its actual expense level with what would be "predicted" on the basis of its region, central-city location, local wage rate, and so forth. It is therefore of some interest to display these discrepancies between actual and "predicted" values, or regression residuals, for the authorities in our sample.

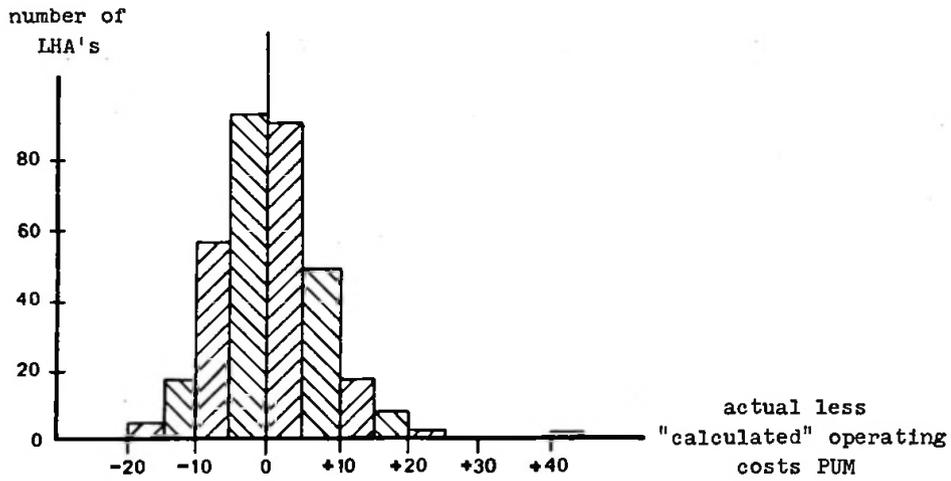
Chart 1 shows a frequency distribution of these residuals for the full sample in 1970. For authorities not in the sample we would expect somewhat larger residuals than the ones shown in Chart 1, since the multiple regression procedure works so as to make the sample residuals as small as possible.

We note that the frequency distribution is slightly skewed to the right --that is, there are a small number of authorities whose actual expenses greatly exceeded "predicted" expenses and no corresponding "tail" of the distribution for authorities with actual expenses far below "predicted" expenses. In all, there are 11 housing authorities of the sample of 337 for which actual expenses exceeded "predicted" expenses by \$15 PUM or more and only five for which actual costs fell below "predicted" expenses by \$15 PUM or more.

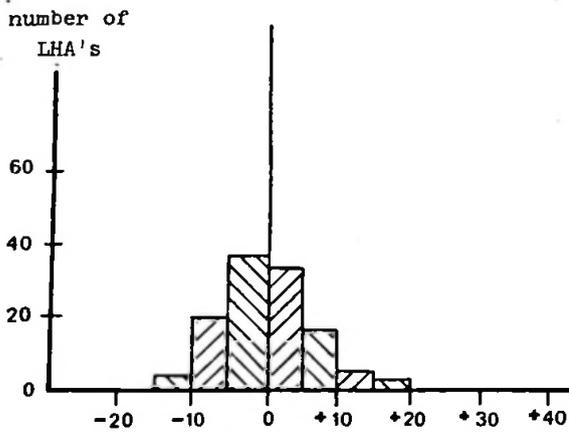
On the average, the residuals tend to be greater for small housing authorities than for large ones. The bottom panel of the chart shows that none of the residuals greater than +\$20 or less than -\$15 occurred in a large LHA. Probably an important cause of this difference between small

Chart 1

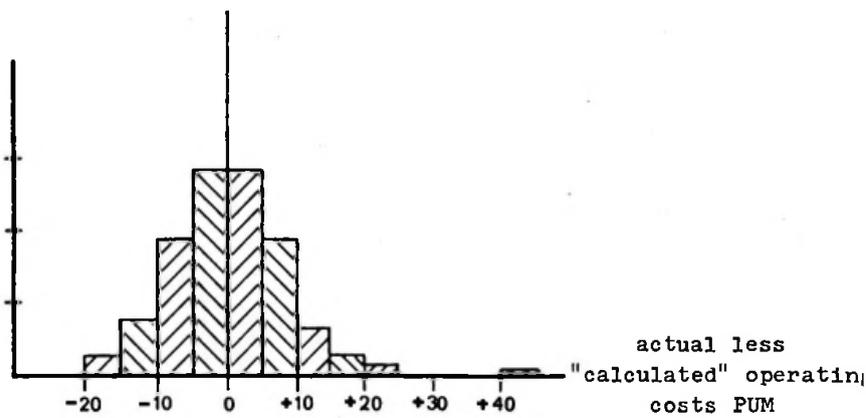
RESIDUALS BETWEEN ACTUAL AND PREDICTED EXPENSES, 1970



All 337 Housing Authorities

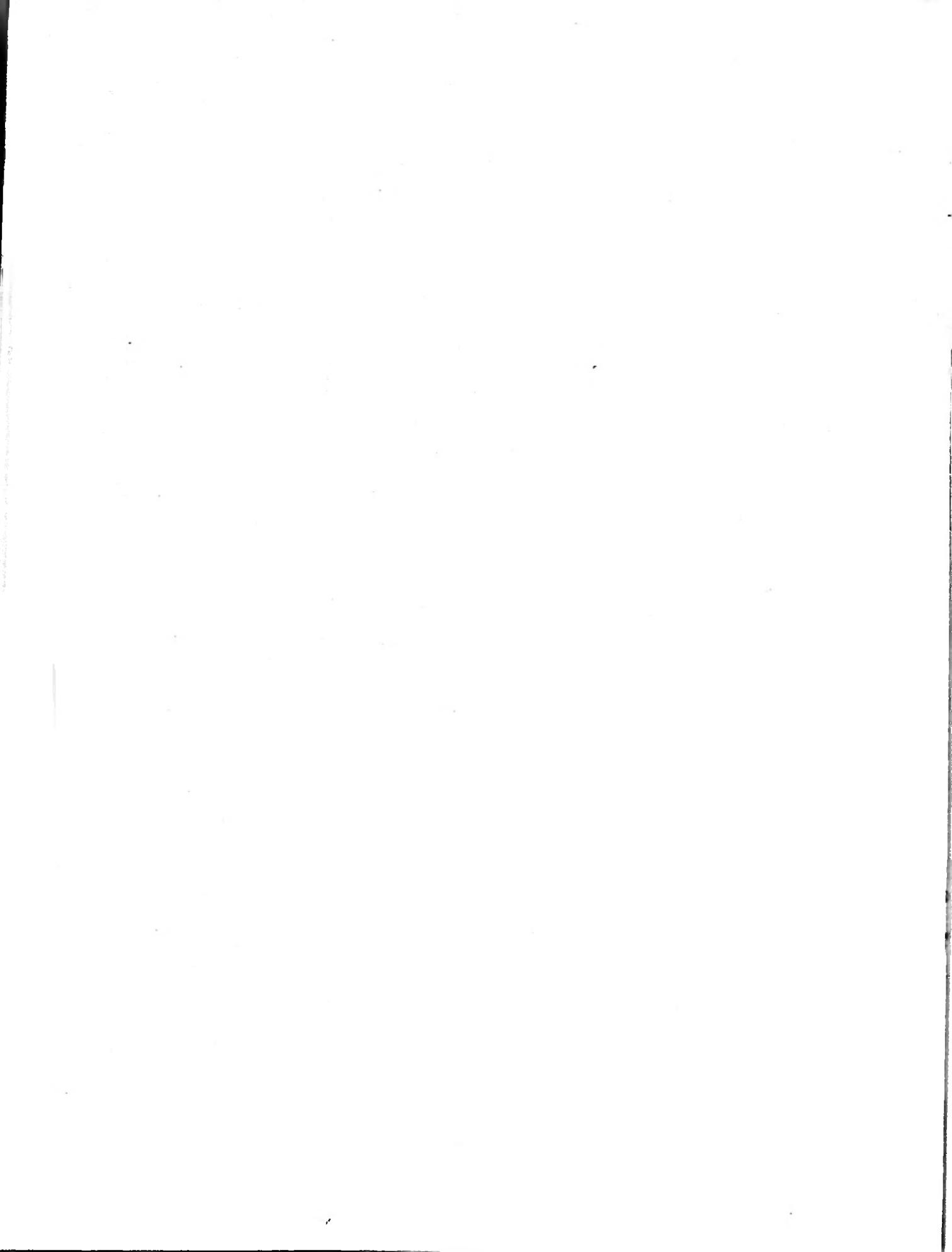


116 Large Housing Authorities



221 Small Housing Authorities

and large LHA's is missing information; in particular, the use of a one-zero variable indicating absence of wage data in place of an actual wage variable is much more common among the small LHA's than among the large ones.



III. THE RATE OF CHANGE OF OPERATING EXPENSES

The present section focuses on rates of change rather than levels of expenses. It is useful to separate rates of change from levels because many of the factors which affect expense levels change very little from year to year. For example, the region or central-city location of an LHA obviously does not change at all from year to year, and variables like the elderly proportion change very little from year to year for the great bulk of LHA's. In fact, of all the factors considered in the preceding section only wage rates change significantly from year to year for a large proportion of housing authorities. Regression analysis based on all of the variables in the preceding section is not particularly helpful in analyzing cost changes. A simpler analysis is appropriate.

Accordingly, the present section begins with an examination of year-to-year changes in total operating expenses per unit per month for groups of housing authorities in the sample. It then compares these changes with some measures of overall inflation in order to assess the role of general inflation in accounting for recent increases in operating expenses. An appendix decomposes the 1970-71 change in operating expenses into major cost components.

This section covers the years 1968 through 1971. The terminal year of an earlier study of public housing operating costs was 1968, and hence the decision to begin the present study with that year affords some continuity

with the earlier work.⁸ Inclusion of 1968 and 1969 in addition to 1970 and 1971, however, has the disadvantage of further diminishing the 1970 sample either because of absence of information or because of authorities which came into existence between 1968 and 1970. The present section accordingly is based on data for 288 LHA's (rather than the full 337) for which data was available for all four years, 1968 through 1971. Most of the "missing" authorities are small LHA's outside of central cities in the South, Midwest, and West.

It is helpful to bear in mind throughout this section that year-to-year percent changes in total operating expenses are subject to a great many erratic influences. The timing of particular nonrecurring expenses can have a drastic affect on year-to-year changes, sometimes affecting rates of change by 30 percent or more. This erratic behavior means that too much significance cannot be attached to rates of change for subgroups of the total sample, especially where the number of observations involved is fairly small.

RATES OF CHANGE BY SIZE, LOCATION, AND REGION

Operating expenses generally increased from 1968 to 1971, with the rate of increase itself increasing between 1968-69 and 1970-71. This is the main conclusion which stands out from Table 5, summarizing rates of change for various subgroups of the sample. In every subgroup of the table but one (the large LHA's of the Midwest and West), the rise in costs from 1970 to 1971 exceeded the rise from 1968 to 1969. Acceleration was clearly a characteristic of operating expenses during the period.

Other tendencies suggested by the table are much weaker. Cost increases were often higher in large housing authorities than in small ones.

⁸ De Leeuw (1970).

Table 5

ANNUAL RATES OF CHANGE OF TOTAL OPERATING EXPENSES PER UNIT,
288 HOUSING AUTHORITIES, 1968-71

	Number of Authorities	Annual Percentage Increase in Costs Per Unit		
		1968-69	1969-70	1970-71
Large LHA's (more than 1,000 units)				
Central City	80	7.1	7.3	11.4
Non-Central City	28	9.2	4.9	11.0
Northeast	39	8.2	5.9	14.4
South	38	7.6	7.7	12.4
Rest of U.S.	31	6.8	5.2	6.2
Small LHA's (less than 1,000 units)				
Central City	15	6.0	7.3	8.4
Non-Central City	165	6.3	8.0	8.4
Northeast	24	4.0	11.4	8.7
South	117	6.5	8.2	8.5
Rest of U.S.	39	7.0	4.8	8.1

As between central city and noncentral city or as among regions of the country, no sharp differences emerge. The largest cost increases in the entire sample were clearly the 1970-71 changes for large housing authorities.

The changes shown in Table 5 represent an acceleration from the 1965-1968 period. In that period the rate of increase for all U.S. housing authorities averaged only 2.9 percent per year, and accelerated to 6.6 percent by 1967-68.⁹

The statistically-minded may be interested in the following regression based on 864 observations (288 LHA's for each of three years). Y is the percent change in operating expense per unit per month, X_1 is a dummy variable equal to 1 for a 1970-71 change and 0 for 1968-69 or 1969-70 changes, and X_2 is a dummy variable equal to 1 for LHA's in the Midwest and West and 0 for LHA's in the Northeast and South.

$$Y = 7.6 + 2.4X_1 - 2.0X_2$$

(2.0) (1.5)

Figures in parentheses are t-ratios. The regression indicates that 1970-71 changes average 2.4 percent more than earlier changes, and that the probability of this result being due to chance is just under 5 percent. Midwest and west LHA's have cost changes 2 percent lower than other LHA's, but the probability of this result being due to chance exceeds 10 percent. Other variables proved less significant than X_2 .

⁹De Leeuw (1970), p. 28. These 1965-68 changes are based on the year-to-year change in operating expenses averaged over all housing units in the country, whereas Table 5 is based on averages of housing authorities. The earlier method in effect weights housing authorities by the number of units under their jurisdiction and hence results in a figure heavily influenced by large LHA behavior. Since Table 5 is based on all large LHA's and only a 15 percent sample of small ones, an average of the LHA's included in that table is also weighted toward the behavior of large LHA's, but not so much as the figures in the earlier study.

COMPARISON WITH MEASURES OF GENERAL INFLATION

For assessing the role of general inflation in accounting for these housing authority expense increases, some statistics on general inflation are essential. Table 6 presents some figures based on a well known indicator of wage changes, "average annual earnings per full-time employees," as tabulated by the Bureau of Economic Affairs of the U.S. Department of Commerce. The general picture of the table is one of stable-to-declining rates of wage increase. In 1968-69 rates of increase ranged from 6 to 8 percent for the industries shown while by 1970-71 they ranged from 4 to under 7 percent.¹⁰

We would expect the contribution of general inflation to the increase in public housing operating expenses to be no larger than the rates of wage inflation quoted above. The reason is that prices of non-labor commodities purchased by housing authorities--water, equipment, electricity, paper, etc.--have on the whole been subject to smaller rates of increase than wages. Wholesale prices of all industrial commodities, to take a rough overall indicator, increased by 3.4 percent, 3.8 percent, and 3.6 percent during 1968-69, 1969-70, and 1970-71--significantly less than the rates of wage inflation in Table 6. One important exception is utility price; the "fuels and utilities" component of the consumer price index, while increasing by only 2.3 percent in 1968-69, accelerated to a 7.0 percent rise by 1970-71.

A rough overall measure of the expected contribution of inflation to the rise in operating expenses, is a weighted combination of the

¹⁰ Another comprehensive indicator of wage changes, the "compensation per man-hour" index for the total private economy compiled by the Bureau of Labor Statistics, shows rates of increase a little higher than the first row of Table 6, but also suggests a slightly declining rate of increase. The Bureau of Labor Statistics percent changes are 7.4 percent for 1968-69, 7.3 percent for 1969-70, and 6.9 percent for 1970-71.

Table 6

PERCENT CHANGES IN ANNUAL EARNINGS
PER FULL-TIME EMPLOYEES BY INDUSTRY

Industry	Percent Change		
	1968-69	1969-70	1970-71
All Industries	+6.6%	+6.7%	+6.5%
Contract Construction	+8.3	+7.9	+6.6
Miscellaneous Repair Services	+7.3	+5.6	+3.9
State and Local Governments (except Education)	+6.2	+8.1	+5.8

Source: U.S. Department of Commerce, Survey of Current Business,
July 1972, p. 40, Table 6.5.

"all-industries" change in earnings, the change in the utilities component of the consumer price index, and the change in wholesale prices of industrial commodities. Weights of .6, .2, and .2 for these three indicators reflect the approximate relative importance of labor, utilities, and other supplies in the operating costs of a typical LHA. On this basis, the rise in operating expenses attributable to inflation was 5.1 percent in 1968-69, 5.6 percent in 1969-70, and 6.0 percent in 1970-71.

As against these estimates of the contribution of inflation to the rise in operating expense, we have the actual increases recorded in Table 5. For 1968-69, these actual increases average 7.6 percent for large LHA's and 6.3 percent for the small LHA's in the sample. The estimated inflation contribution of 5.1 percent is about 70 percent of the cost increase for large authorities and 80 percent of the cost increase for small authorities. For 1968-69, then, it still seems safe to say that the great bulk of the increase in operating expenses is attributable to inflation.¹¹

For 1970-71, the conclusion is somewhat different. Actual increases work out to an average of 11.3 percent for large authorities and 8.4 percent for the sample of small authorities, compared to an estimated inflation contribution of 6.0 percent. For small authorities the inflation contribution is a little over 70 percent of the actual rise, while for large authorities the inflation contribution is only a little over half of the actual rise. These statistics thus suggest that a significant share of cost increases in 1970-71 was associated with factors other than inflation.

¹¹An analysis suggesting that this was the case in the years 1964-68 appears in de Leeuw, op. cit., pp. 48-50.

These comparisons of rates of change are summarized in the following table:

	Approximate Cost Increase Attributable to Inflation	Actual Cost Increase (Large LHA's)	Actual Cost Increase (Small LHA's)
1968-69	+5.1%	+ 7.6%	6.3%
1969-70	+5.6%	+ 6.7%	7.9%
1970-71	+6.0%	+11.3%	8.4%

The regression analysis of expense levels in the previous section of this report supports the same conclusion. To relate that analysis to 1970-71 changes it is useful to deal with a housing authority which has "average" characteristics in all respects except for its local wage rate.¹² For such an authority, we can collapse the entire regression results shown in the last column of Tables 3 and 4 into the following two simple relationships:

$$1970 \text{ Expenses PUM} = \$24.34 + .040 \times (\text{average monthly wage})$$

$$1971 \text{ Expenses PUM} = \$35.39 + .024 \times (\text{average monthly wage})$$

Now if the wage rate facing this hypothetical housing authority were equal to \$500 per month in both years, then the "predicted" expense level

¹²This average LHA is something like the mythical "average family" with 2.3 children; it is half in an SMSA and half outside, 6 percent in New England, etc.

for 1970 would be \$44.34 and for 1971 would be \$47.39.¹³ These calculations suggest a cost increase of \$3 per unit per month or nearly 7 percent apart from any direct wage influences. Some of the \$3--but almost certainly no more than half of it--was due to increases in prices of utilities, supplies, and other non-labor prices.

On the wage side, the municipal earnings rate used in the regressions rose by an average of 6.7 percent in the LHA locations for which data were available. Keeping the wage level at \$500 for 1970 and raising it to \$533.50 for 1971 (a rise of 6.7 percent) raises the "predicted" expense levels for 1971 to \$48.19. The total predicted increase is now close to 9 percent; but less than 2 of the 9 percent stems from wage change and probably no more than 3 percent from other price increases.

These calculations are cumbersome and are sensitive to the exact wage levels used in the calculations. Under plausible assumption, however, they too suggest that operating cost increases in 1970-71 were more than just a matter of general inflation.

The present study can take us no farther in probing the apparent "unexplained" rise in costs from 1970 to 1971. Legislative changes, accumulation of maintenance needs, local LHA labor negotiations, management problems --all may have played important roles, but the data collected for this

¹³ Six hundred dollars (\$600) was in fact the average 1970-71 wage for authorities where wage information was available; but since the authorities where wage information was missing included many small towns in the South, \$500 is probably a better estimate of the average monthly wage for all localities in the sample. Both these averages are probably biased downward as a measure of labor cost in that they exclude fringe benefits; but such a general bias will tend to be offset by a corresponding upward bias in the wage coefficients in the equations above. Calculations employing the equations above should consequently make use of the same wage measure as entered into their estimation.

study cannot measure their quantitative importance. Nor do we know at this point whether the high rates of cost increase from 1970 to 1971 continued into 1972. The present study carries us only to the point of identifying an exceptionally rapid increase in operating costs during 1970-71, and concluding that other factors besides general inflation caused a significant share of the increase.

APPENDIX A:

THE COMPONENTS OF OPERATING EXPENSE LEVELS

Section II of this report analyzed the relation of total operating expenses per unit per month to variables describing location, local economic conditions, and housing authority characteristics. Six major components of operating expenses per month are related to these same variables in Table 7. The six components account for about nine-tenths of total costs.

Of the six components, ordinary maintenance and operation has the closest relation to the explanatory variables (the coefficient of determination, R^2 , is equal to .76) while property betterments and additions--a highly irregular component--has the least close relationship ($R^2 = .07$). In between are administrative costs ($R^2 = .56$), payments in lieu of taxes ($R^2 = .49$), utilities ($R^2 = .33$), and extraordinary maintenance ($R^2 = .13$).

Among the explanatory variables one or more of the regional variables is significantly related to every component except betterments and additions. The other location variables are related to ordinary and extraordinary maintenance. Local wage rates are significantly related to administrative costs, maintenance costs and--perhaps surprisingly--payments in lieu of taxes. The elderly proportion--representing size of units as well as age of occupants--is also related to payments in lieu of taxes, as well as to ordinary and extraordinary maintenance. The number of units and the square of number of units, finally, is related to administrative costs, utility costs, and ordinary maintenance costs.

Table 7

REGRESSION ANALYSIS OF COMPONENTS OF TOTAL OPERATING EXPENSES (PUM),
337 HOUSING AUTHORITIES, 1970

A. Administration, Utilities, & Ordinary Maintenance

	Administration		Utilities		Ordinary Maintenance & Operation	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant Term	6.28	6.6	7.12	2.2	4.75	2.4
Location Variables						
Non-SMSA Location (1-0)	-9.03	0.2	.353	0.2	-2.57	2.4
Suburban Location (1-0)	-.450	1.4	-.946	0.8	-1.28	1.9
Place Population (non-SMSA only, 000)	.0022	0.2	.043	1.0	.006	2.3
Region 1 (Boston)	.417	0.9	4.73	3.1	3.89	4.4
Region 2 (New York)	1.12	2.8	6.97	5.1	2.50	3.0
Region 3 (Philadelphia)	1.82	4.7	3.19	2.5	.992	1.2
Region 4 (Atlanta)	-1.48	5.1	-.068	0.7	-1.88	3.2
Region 6 (Fort Worth)	-1.79	5.6	-1.66	1.6	-3.29	5.1
Region 9 (San Francisco)	1.97	3.8	-3.17	1.8	3.89	3.7
Economic Variable						
Average Monthly Wage	.0040	2.8	.008	1.6	.0200	7.0
"common municipal function" Wage Data Absent	1.5	1.7	1.26	0.4	10.32	5.6
Housing Authority Variables						
Elderly Proportion	-.739	1.4	1.06	0.6	-5.58	5.1
Elderly Data Absent (1-0)	-2.62	0.3	-4.49	1.5	-4.70	2.6
Number of Units (000)	.201	3.8	.455	2.5	1.02	9.5
Square of Number of Units (000)	-.002	2.9	-.005	2.0	-.001	7.1
Reporting Quarter (1-4)	-.145	1.8	.043	0.2	.239	1.5
R ²	.56		.33		.76	
Standard Error of Estimate	\$1.64		\$5.52		\$3.29	

Table 7--Continued

B. Payments in Lieu of Taxes, Extraordinary Maintenance, & Property Betterments & Additions

	Payments in Lieu of Taxes		Extraordinary Maintenance		Property Betterments & Additions	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Constant Term	2.46	6.0	2.90	1.5	.220	0.2
Location Variables						
Non-SMSA Location (1-0)	-.102	0.5	-.110	0.1	.010	0.01
Suburban Location (1-0)	-.074	0.5	-1.26	1.9	-3.30	0.9
Place Population (non-SMSA only, 000)	.004	0.8	.061	2.4	.027	2.0
Region 1 (Boston)	.553	2.9	-.370	0.4	-.510	1.1
Region 2 (New York)	.855	4.9	2.55	3.1	-.770	1.8
Region 3 (Philadelphia)	.423	2.6	-.279	0.3	-.186	0.4
Region 4 (Atlanta)	-.401	3.3	-.738	1.2	.106	0.3
Region 6 (Fort Worth)	-.614	4.6	-1.34	2.1	-.251	0.7
Region 9 (San Francisco)	.477	2.2	-1.62	1.6	.338	0.6
Economic Variable						
Average Monthly Wage, "common municipality functions"	.0025	4.2	.0027	0.9	.0019	1.2
Wage Data Absent (1-0)	1.23	3.2	.456	0.3	-.050	0.05
Housing Authority Variables						
Elderly Proportion	-1.05	4.6	-3.04	2.8	.542	0.9
Elderly Data Absent (1-0)	-.504	1.3	-2.82	1.5	4.56	4.7
Number of Units (000)	-.014	0.6	.087	0.8	-.035	0.6
Square of Number of Units (000)	.0002	0.8	.0005	0.03	.0004	0.5
Reporting Quarter (1-4)	-.035	1.0	.057	0.3	-.062	0.7
R ²	.49		.13		.07	
Standard Error of Estimate	\$.69		\$3.29		\$1.77	

APPENDIX B:

THE COMPONENTS OF OPERATING EXPENSE CHANGES

Section III of this report presented a table (Table 5) showing rates of change of total operating costs. The contribution of six major components to the 1970-71 change in costs is shown in Table 8 for four groups of LHA's--central city and noncentral city for large LHA's and central city and noncentral city for small LHA's.

The percentages in the table are changes in each cost component divided by total costs, averaged over the LHA's in each of the four groups. If the six components of cost covered all LHA costs, then the percentages shown for the six components would add up to the percent change in total costs. Since the six do not cover all LHA costs, the percentages do not add up exactly.

The table indicates that the faster rate of increase of total costs in large LHA's than in small LHA's is accounted for mainly by utility costs and ordinary maintenance costs. For several other categories, in fact, the cost increases for small LHA's were greater than for large LHA's. As between central city LHA's and noncentral city LHA's, the most striking difference is in the growth of extraordinary maintenance, which was faster in the central city group.

One of the six components, payments in lieu of taxes, declined on the average in each of the four groups of LHA's. The finding that factors other than inflation had important effects on cost increases in 1970-71

Table 8

PERCENT CHANGES IN SIX COMPONENTS OF OPERATING EXPENSES,
288 HOUSING AUTHORITIES, 1970-71

Cost Component	P e r c e n t C h a n g e			
	108 Large LHA's		180 Small LHA's	
	Central City	Non-Central City	Central City	Non-Central City
Total Operating Costs Per Unit Per Month	+11.4	+11.0	8.4	8.4
Contributions to Total of Cost Components:				
Administration	.8	.3	1.0	1.4
Utilities	3.4	3.4	1.2	2.3
Ordinary Maintenance	3.6	3.1	2.5	2.4
Payments in Lieu of Taxes	- .4	- .5	- .5	- .2
Extraordinary Maintenance	1.1	.5	4.1	.8
Property Betterments & Additions	.2	0	1.3	.7

is strengthened by this fact, since it follows that operating costs apart from these negotiated payments to local governments grew at even faster rates than the ones presented in Table 5.

APPENDIX C:

SOURCES OF DATA

1. LOCAL HOUSING AUTHORITIES IN THE PUBLIC HOUSING EXPENSE SAMPLE

REGION I

Connecticut

Bridgeport
Hartford
Meriden
New Haven
Norwich

Maine

Portland

Massachusetts

Boston
Brockton
Cambridge
Fall River
Holyoke
Lowell
Lynn
New Bedford
Newburyport
Worcester

New Hampshire

Concord

Rhode Island

Newport
Providence

REGION 2

New Jersey

Asbury Park
Atlantic City
Bayonne
Camden
Edison
Elizabeth
Hoboken
Irvington
Jersey City
Lakewood
Long Branch
Newark
New Brunswick
Paterson
Perth Amboy
Redbank
Trenton

New York

Albany
Buffalo
Freeport
Mount Kisco
New York City
Ogdensburg
Syracuse
Watervliet
Yonkers

REGION 3

Delaware

Dover
Wilmington

Maryland

Baltimore
Cumberland
Rockville

Pennsylvania

Allegheny County
Beaver County
Bethlehem
Carbondale
Chester
Delaware County
Easton
Fayette County
Harrisburg
Johnstown
McKeesport
Philadelphia
Pittsburgh
Reading
Scranton

Virginia

Danville
Newport News
Norfolk
Portsmouth
Richmond

Washington, D.C.West Virginia

Fairmont
McMechen

REGION 4

Alabama

Abbeville
Birmingham
Brantley
Childsburg
Columbia
Dothan
Elba
Eufaula
Hallevsille
Hanceville
Hartford
Huntsville
Jasper
Lineville
Mobile
Montevallo
Montgomery
Opelika
Opp
Piedmont
Ragland
Sulligent
Valleyhead

Florida

Arcadia
Dade County
Defuniak Springs
Jacksonville
Key West
Mariana
Milton
Orlando
Palatka
Plant City
Tampa

Georgia

Adairsville
Arlington
Athens
Atlanta
Augusta
Buchanan
Camilla
Carrollton

Georgia (cont.)

Cleveland
 Columbus
 Cordele
 Decatur
 Douglas
 Douglas County
 Edison
 Franklin
 Gibson
 Harris County
 Hawkinsville
 Lavonia
 Macon
 Monticello
 McDonough
 McRae
 Pearson
 Quitman
 Savannah
 Summerville
 Tefton
 Union City
 Union Point
 Vienna
 Warner Robins
 West Point
 Woodbury
 Woodland

Kentucky

Barbourville
 Catlettsburg
 Dawson Springs
 Eminence
 Glasgow
 Lexington
 London
 Louisville
 Lyon County
 Martin
 Mayfield
 Owenton
 Paducah
 Williamsburg

Mississippi

Columbus
 Corinth
 Mississippi Region #8 (Gulfport)
 Okolona
 Shelby

North Carolina

Durham
 Charlotte
 Greensboro
 High Point
 Mount Airy
 New Bern
 Wake County
 Wilmington
 Winston-Salem

South Carolina

Charleston
 Columbia
 Regional Housing Authority A #1
 (Laurens)
 Spartanburg

Tennessee

Chattanooga
 Clinton
 Columbia
 Franklin
 Knoxville
 Lafollette
 Lawrenceburg
 Lewisburg
 Martin
 Memphis
 Nashville

REGION 5

Illinois

Champaign County
 Chicago
 Danville
 East St. Louis
 Johnson County
 Joliet
 Lake County
 Menard County
 Perry County
 Peoria
 Rockford
 White County

Indiana

Gary
 Huntingburg
 Indianapolis
 Kokomo

Michigan

Bessemer
 Bronson
 Detroit
 Flint
 South Lyon
 River Rouge

Minnesota

Deluth
 Minneapolis
 St. Paul
 Virginia
 Wadena
 Winona

Ohio

Akron
 Butler
 Cincinnati
 Cleveland
 Columbus
 Dayton
 Martins Ferry
 Toledo

Ohio (cont.)

Yellow Springs
 Youngstown

Wisconsin

Stanley
 Milwaukee

REGION 6

Arkansas

Dell
 Hot Springs
 Howard County
 Hughes
 Little Rock
 Magnolia
 Mena
 Newport
 Ola
 Rector
 Salem
 Sparkman
 Texarkana
 Van Buren
 Waldron
 West Helena

Louisiana

Bunkie
 Delcambre
 East Baton Rouge
 Elton
 Eunice
 Kaplan
 Kinder
 Lake Arthur
 Merryville
 New Orleans
 Oakdale
 Sulphur

New Mexico

Gallup
Sante Fe

Oklahoma

Oklahoma City
Tulsa

Texas

Alto
Austin
Baytown
Beaumont
Belton
Brownsville
Galdwell
Cameron
Cisco
Comanche
Cooper
Corpus Christi
Crystal City
Dallas
De Leon
Devine
El Paso
Fort Worth
Frisco
Galveston
Gorman
Groesbeck
Houston
Jefferson
Laredo
Leonard
Marlin
Moody
Nocona
Pineland
Pharr
San Antonio
Taft
Trinidad

REGION 7

Missouri

Holcomb
Jefferson City
Kansas City
St. Louis

Nebraska

Bassett
Deshler
Friend
Grant
Hay Springs
Loup City
Omaha
Scott's Bluff County
Shelton
Tilden
Verdigre
Winnebago

REGION 8

Colorado

Denver
Holly
Trinidad

Montana

Helena

North Dakota

Williston

REGION 9

Arizona

Phoenix
Tucson
Winslow

California

Contra Costa County
Imperial
Kern County
Kings County
Los Angeles
Los Angeles County
Monterey County
Oakland
Riverside
San Francisco
San Joaquin County
Soledad

REGION 10

Idaho

Buhl
Nampa

Oregon

Douglas County
Portland

Washington

Island County
King County
Paso
Seattle
Tacoma

2. LHA AND LOCALITY DATA

Financial data were obtained from Trend Statement: Operating Receipts, Operating Expenditures, Residual Receipts and Operating Reserves, Program Services Division, Financial Management Branch, U.S. Department of Housing and Urban Development, May 1972; HUD Forms 52612 and 52599.

Housing authority occupancy data--number of units, number of elderly households, vacancies, and turnover--were obtained from HUD Form 51235 and from Report S101, Low Rent Project Directory, Statistics Branch, U.S. Department of Housing and Urban Development, December 1969.

Data on public employee payrolls came from Local Government Employment in Selected Metropolitan Areas and Large Counties, Bureau of the Census, U.S. Department of Commerce, 1970 and 1971. Data on locality populations came from the 1970 Census of Population.

Data on average January temperature came from Climatological Data--National Summary, Vols. 19, 20 and 23, Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.



ADDITIONAL INSTITUTE PUBLICATIONS ON HOUSING

BOOKS AND REPORTS

- New Towns-In Town: Why a Federal Program Failed*, Martha Derthick, 1972, URI 70006, 702 pp., \$2.95
- Mobile Homes: The Unrecognized Revolution in American Housing*, Margaret Drury, 1972, URI 70009, Hard cover, \$15.00
- Thinking About Housing: A Policy Research Agenda*, Morton L. Isler, 1970, URI 60004, 47 pp., \$1.25
- Property Taxation, Housing and Urban Growth: With Attention to Tax Reform and Assessment Modernization*, Walter Rybeck, Moderator, 1970, URI 30002, 72 pp., \$2.50
- Operating Costs in Public Housing: A Financial Crisis*, Frank de Leeuw and Eleanor Lippman Tarutis, 1969, URI 30001, 63 pp., \$1.50

PAPERS

- Publicly Provided and Assisted Housing in the U.S.A.: Report on HUD's Housing Management Policies and Programs*, John Macey, 1972, URI 30010, 80 pp., \$1.00
- The Distribution of Housing Services*, Frank de Leeuw, 1972, URI 14000, 121 pp., \$3.00
- Residential Zoning and Equal Housing Opportunities: A Case Study in Black Jack, Missouri*, Ronald F. Kirby, Frank de Leeuw, and William Silverman, assisted by Grace Dawson, 1972, URI 19000, 34 pp., \$2.00
- The Transfer Cost of a Housing Allowance: Conceptual Issues and Benefit Patterns*, John D. Heinberg, 1971, URI 30004, 80 pp., \$2.50
- The Design of a Housing Allowance*, Frank de Leeuw, Sam H. Leaman, and Helen Blank, 1970, URI 30005, 42 pp., \$2.00
- Housing Management: A Progress Report*, Morton L. Isler, Margaret J. Drury, and Clay H. Wellborn, 1971, URI 30006, 106 pp., \$2.50
- Time Lags in the Rental Housing Market*, Frank de Leeuw and Nkanta F. Ekanem, 1970, URI 80006, 57 pp., \$1.50
- Land Banking: Public Policy Alternatives and Dilemmas*, Sylvan Kamm, 1970, URI 30007, 74 pp., \$2.00

REPRINTS

- The Demand for Housing: A Review of Cross-Section Evidence*, Frank de Leeuw and Nkanta F. Ekanem, 1971, URI 40005, 10 pp., 50¢
- The Goals of Housing Subsidy Programs*, Morton L. Isler, 1971, URI 10020, 23 pp., 50¢
- The Housing Allowance Approach*, Frank de Leeuw, URI 10021, 15 pp., 50¢
- The Incidence of Differential Property Taxes on Urban Housing: A Comment and Some Further Evidence*, John D. Heinberg and Wallace E. Oates, URI 10018, 8 pp., 50¢
- The Section 23 Leasing Program*, Frank de Leeuw and Sam H. Leaman, 1972, URI 10087, 18 pp., 50¢
- The Supply of Rental Housing*, Frank de Leeuw and Nkanta F. Ekanem, 1971, URI 40009, 12 pp., 50¢

