

Operating Costs in Public Housing

A Financial Crisis



Frank de Leeuw

Brookings
The Urban Institute

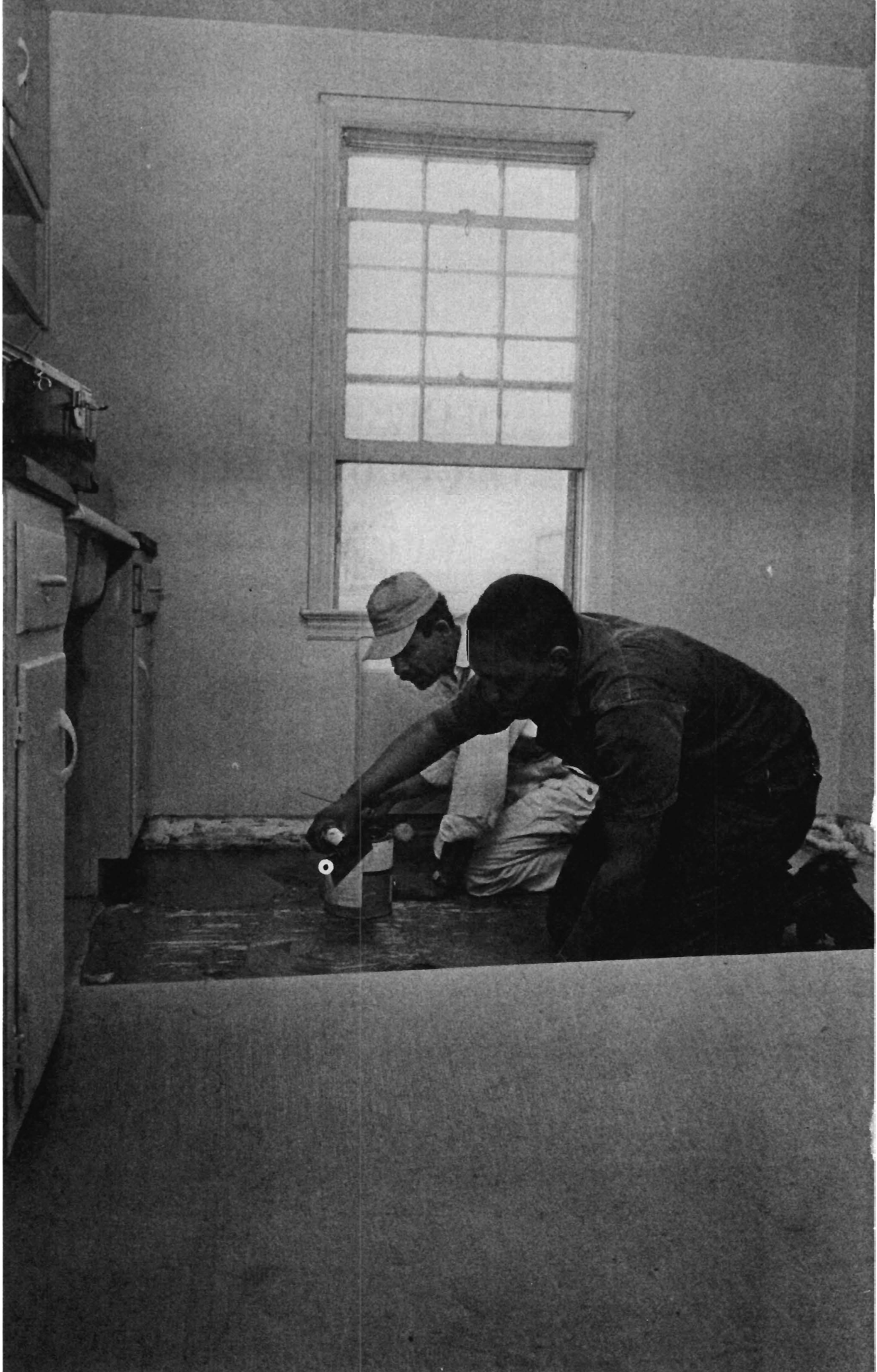
The Urban Institute is a private, nonprofit research corporation established in 1968 to study problems of the nation's urban communities. Independent and nonpartisan, the Institute responds to current needs for disinterested analyses and basic information and attempts to facilitate the application of this knowledge. As part of this effort, it cooperates with federal agencies, states, cities, associations of public officials, the academic community and other sectors of the general public.

The Institute's research findings and a broad range of interpretive viewpoints are published as an educational service. Conclusions expressed in Institute papers are those of the authors and do not necessarily reflect the views of other staff members, officers or directors of the Institute, or of organizations which provide funds toward support of Institute studies.



**OPERATING COSTS
IN PUBLIC HOUSING:**

A Financial Crisis



OPERATING COSTS
IN PUBLIC HOUSING:
A Financial Crisis

by Frank deLeeuw
assisted by
Eleanor Littman Jarutis



THE URBAN INSTITUTE

Cover and frontispiece photos by Bernie Boston in cooperation with the National Capital Housing Authority.

SBN No. 87766-002-6

Library of Congress Catalog Card No. 74-129111

UI 8-112-11

Available from:

Publications Office
The Urban Institute
2100 M Street, N. W.
Washington, D. C. 20037

List price: \$1.50

Printed in the United States of America

Foreword

Public housing operating costs have been rising rapidly in recent years, and rental income has been running well below operating costs for many local housing authorities, the agencies that manage federally supported public housing. With federal government payments restricted until late 1969 to capital costs (and small supplementary payments for the elderly and a few other groups), the result has been a rapid growth in operating deficits. "Crisis" is not too strong a word to describe the situation.

This report attempts through analysis to shed light on a matter that has been infused with considerable emotional heat. It seeks to measure the relative importance of various influences on rising operating costs and, within the framework of the present public housing rent system, to assess the financial outlook for public housing.

The report is part of a continuing program of research at The Urban Institute into the problems of operating low-income housing. It was prepared in the summer and early fall of 1969 by Frank deLeeuw of the Institute Senior Research Staff with the assistance of Eleanor Jarutis. Modifications in the federal formula of support to public housing, along the lines of certain options mentioned in this research, were later enacted in the Housing and Urban Development Act of 1969.

The Department of Housing and Urban Development provided funding for the research and made available much unpublished information. The findings and conclusions, however, are exclusively the responsibility of the authors at The Urban Institute.

Contents

Foreword 5

Part One

Public Housing Operations in 23 Cities

Chapter 1 Nature of the Crisis 11
 Central Findings, 12
 Some Implications, 13

Chapter 2 Public Housing in 23 Large Cities 18
 Public Housing Costs and Rents, 20
 Public Housing Characteristics, 20

Chapter 3 Current Trends in Costs and Receipts 26
 Recent Trends in Operating Costs, 27
 Trends in Factors Affecting Costs, 28
 Trends in Rents and Tenant Income, 29

Part Two
Statistical Analysis

<i>Chapter 4</i>	<p>The Cost of Public Housing Operation 31</p> <p style="padding-left: 2em;">A Framework for Studying the Cost of Housing Operation, 31</p> <p style="padding-left: 2em;">The Variables and Specification of Equations, 33</p> <p style="padding-left: 4em;"><i>Variables</i>, 33</p> <p style="padding-left: 4em;"><i>Specification</i>, 36</p> <p style="padding-left: 2em;">The Pooled Regression Results, 37</p> <p style="padding-left: 4em;"><i>Summary</i>, 37</p> <p style="padding-left: 4em;"><i>Prices and Wages</i>, 38</p> <p style="padding-left: 4em;"><i>Physical Characteristics</i>, 40</p> <p style="padding-left: 2em;">Some Checks on the Pooled Regression Results, 42</p> <p style="padding-left: 4em;"><i>The Components of Total Operating Costs</i>, 43</p> <p style="padding-left: 4em;"><i>Differences Across Cities and Over Time</i>, 45</p> <p style="padding-left: 4em;"><i>Results Excluding New York City</i>, 47</p> <p style="padding-left: 2em;">The Residuals, 48</p> <p style="padding-left: 2em;">The Determinants of Cost Increases, 48</p>	31
<i>Chapter 5</i>	<p>Rent Relationships in Public Housing 51</p> <p style="padding-left: 2em;">Summary, 51</p> <p style="padding-left: 2em;">Statistical Analysis, 53</p> <p style="padding-left: 4em;"><i>Variables</i>, 53</p> <p style="padding-left: 4em;"><i>The Regression Results</i>, 55</p>	51
<i>Data Sources and Limitations</i>	. . . . .	59
<i>References</i>	. . . . .	62

Illustrations

Charts

1. Public Housing Operating Costs and Rents, 1965 through 1968	14
2. Costs and Rents per Unit per Month in Public Housing, 23 Cities	21
3. Relation of Public Housing Costs to Monthly Earnings of City Employees	23
4. Relation of Public Housing Costs to Size of Housing Authority	24
5. Relation of Public Housing Costs to Number of Minors per Unit	25

Tables

1. The Sample of 23 Cities	19
2. The Rise in Operating Costs in Sample Cities	27
3. The National Rise in Operating Costs	28
4. The Rise in Prices and Wages, 1965-68	28
5. Rents and Incomes in Public Housing, 1965-68	30
6. Variables Tested in Relation to Operating Costs	37
7. Explanation of Total Operating Costs per Unit per Month	37
8. Explanation of Total Costs: Alternative Age Variables	40

9.	Explanation of Total Costs: Alternative Tenant Characteristics	42
10.	Explanation of the Main Components of Total Costs.	44
11.	Total Costs: Regression Results for Pooled Observations, 4-year Averages, and Deviations from 4-year Averages	46
12.	Total Costs: Results with and without New York	47
13.	Explanation of the 1965-68 Rise in Public Housing Operating Costs, 23 Cities	50
14.	Explanation of Dwelling Rent per Unit per Month	55
15.	Dwelling Rents—4-Year Averages and Deviations from Average	57

Public Housing Operations in 23 Cities

Chapter 1

Nature of the Crisis

This report deals with current trends in operating costs and receipts in public housing in the United States, based on detailed statistical analysis of the experience of 23 large local housing authorities from 1965 through 1968. It seeks to establish the relative importance of such factors as general price and wage inflation, tenant characteristics, building age, and number of units in accelerating operating costs. It analyzes public housing rental receipts in the same 23 cities in an attempt to establish an aggregate picture of the functioning of the present public housing rent system. Finally, it considers current and possible future trends in the factors influencing costs and rents.

The findings of the report are useful in a number of ways. They are of immediate use in understanding the causes of operating deficits in many public housing authorities and in judging probable future trends in deficits. They shed light on the economic effects of some of the various options for combating deficits, including rent increases or higher federal payments. They could be used as a tool for comparing the financial experience of an individual housing authority with what might be expected in the light of its location, age, size, and tenants, though this possible use is not explored in the report.

To the degree that they provide information about the cost

of operating low-income housing generally, they should be a valuable part of any economic comparison of public housing with other means of assisting low-income families. The scope of the report has definite limits, however, which it is important to recognize at the outset. Since it is strictly an economic analysis, it does not attempt to measure tenant attitudes or consider problems of organization and decision-making in public housing. Nor does it deal with the level and mix of services which housing authorities provide or might provide. Finally, like all statistical analyses its findings are subject to a margin of uncertainty and may have to be modified as knowledge about the operation of housing grows.

Part I of the report describes the study's central findings and some of their major implications. The technical section, Part II, describes in detail the statistical analysis of 23 large local housing authorities.

CENTRAL FINDINGS

The central finding is that price and wage inflation is the major cause of increased operating costs in public housing. These costs were found to have a parallel relationship to general levels of prices and municipal wage rates. Among the 23 cities, those with relatively low prices and municipal wage rates tended to have low operating costs, those with high prices and wages, high operating costs. The rise in prices and wages in the different cities during 1965-68 is sufficient to account for most of the rise in operating costs over this period. The rate of increase of prices and wages has been accelerating; so, likewise, has the rate of increase of public housing operating costs. About four-fifths of the rise in costs from 1965 to 1968 experienced by the 23 local authorities appears to be directly attributable to inflation.

Other important cost factors were evident in particular cities and projects, although these apparently made considerably smaller contributions to the overall cost increases. Aging of the public housing stock, for instance, accounted for about one-tenth of the 1965-68 rise in operating costs in the cities studied. Tenant charac-

teristics, particularly the number of minors per dwelling unit and the percent of units with no wage earner present, are significantly related to costs but have had little aggregate effect because the characteristics of tenants have changed little on an overall basis in recent years. Finally, there appears to be a tendency for large authorities, those managing more units, to have higher unit costs than small ones. *

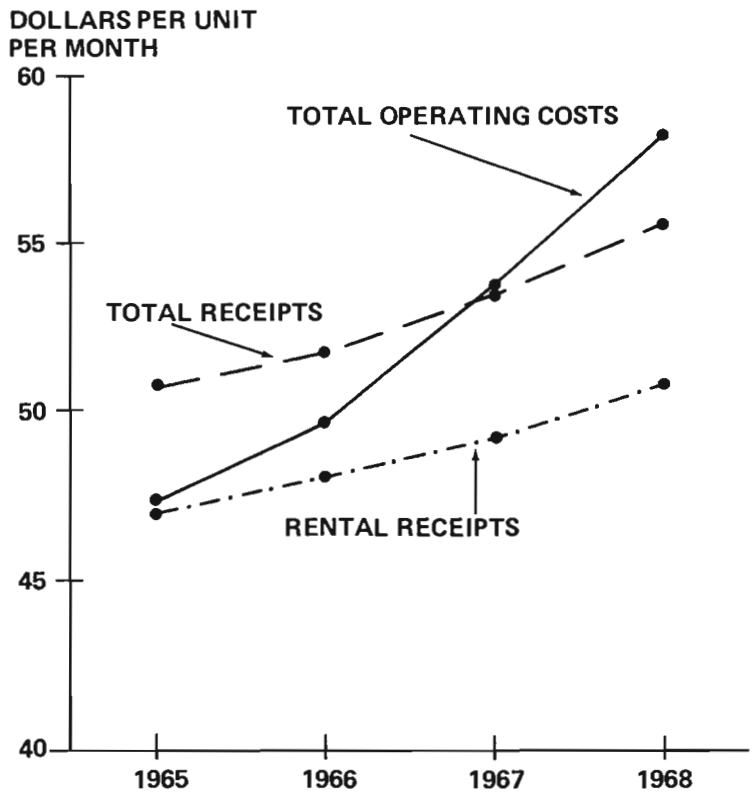
On the rent side, the central finding is that the present complex system of dwelling charges works out so that rents per unit are strongly influenced by costs per unit. However, rent increases have been running consistently 25 percent behind cost increases. In other words, rents have tended to rise by about 75 cents for each dollar increase in operating cost.

The influence of tenant median incomes on rents is surprisingly small. Perhaps this is because cost increases and associated pressures to revise rent schedules have been of overriding importance during the last few years. Or, perhaps it is because of the many departures from a simple rent-to-income relation, such as the use of flat charges per room by some local authorities. Whatever the reason, rents per unit vary much more closely with costs per unit than with median incomes of tenants.

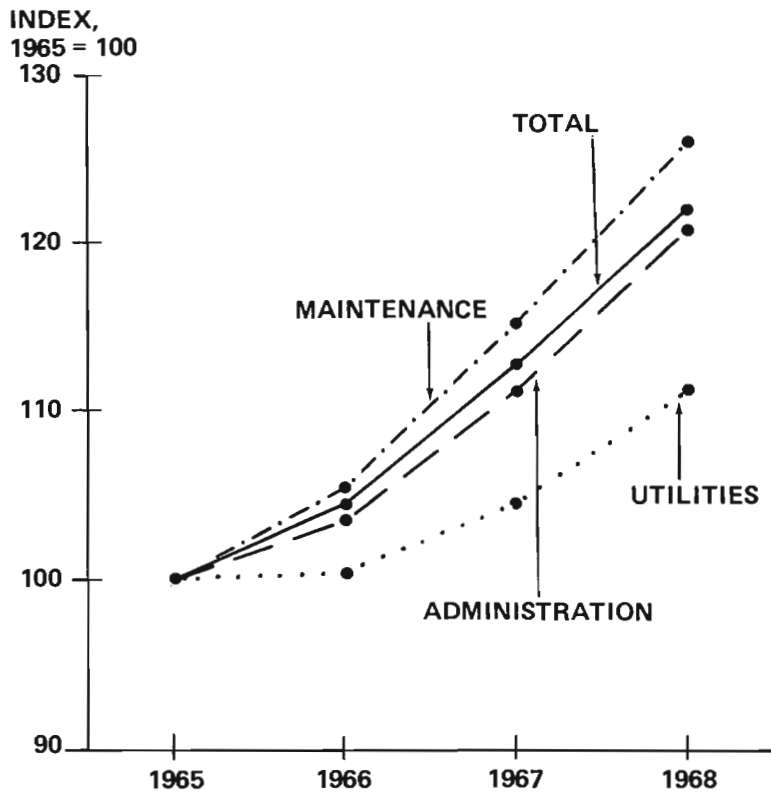
SOME IMPLICATIONS

The findings lead to the conclusion that the gap between costs and rents almost certainly will continue to emerge and grow for many local housing authorities in the near future, certainly so long as prices and wages continue to rise. Chart I shows the trends in costs and rents during the 1965-68 period covered by the study. Prices and wages have been rising more rapidly since 1968 than during that period. Rent increases can be expected to offset only a part of the rising costs, at least as the system has worked out in the past. Growing deficits seem by far the most likely short-run outcome.

CHART 1 OPERATING COSTS AND RECEIPTS IN PUBLIC HOUSING, 1965-68
(AVERAGE OF 23 CITIES)



A. COSTS AND RECEIPTS PER UNIT PER MONTH



B. INDEXES OF OPERATING COSTS PER UNIT PER MONTH, total and selected categories¹

1. The three categories shown cover about three quarters of operating costs. Among the remaining cost items are payments in lieu of taxes, insurance, and employee benefit contributions.

The findings bear on three possible policies for relieving the financial crisis. One is raising rents to fully cover costs. The second involves selecting tenants to reduce costs. The third would increase federal statutory payments or supplemental appropriations.¹ While the study is not intended to fully evaluate these alternatives, it does provide a basis for judging some changes that would accompany each.

A policy of *raising rents* to cover the cost increases in the cities studied would require approximately an 8 percent per year rent hike per unit. Total public housing operating costs in these cities rose 8.4 percent from 1967 to 1968, and the rate of growth currently may well be higher still.²

Median income of tenants in the 23 cities was \$2,444 in 1968. This low figure reflects in part the high proportion of older people in public housing. Median tenant income grew by about 3 percent from 1967 to 1968, a result of both turnover of tenants and income experience of individual tenants. It seems clear that rent increases of the order of 8 percent per year would, after a few years, become an extremely heavy burden on tenants, rapidly reducing the margin between private market and public housing rentals. Of course, it may be possible to raise rents selectively or by more moderate amounts without these undesirable results.

A policy of *reducing the number of minors* per unit—for example, through greater emphasis on housing the elderly and less

1. The typical public housing financing formula provided federal subsidy for debt service, with the local authority required to meet operating expenses almost entirely from rents paid by the tenants. After this study was completed, an amendment offered by Senator Edward W. Brooke and incorporated into the Housing and Urban Development Act of 1969 permitted federal funding of operating expenses when these could not adequately be provided after collecting rents amounting to 25 percent of family incomes of the tenants. The 1969 Act thus established a policy of federal statutory payments to meet the increasing gap between rental receipts and operating costs.

2. For the entire U. S. public housing stock, the growth in total costs from 1967 to 1968 was 6.6 percent, or not quite so high. Yet for both the nation and the 23 cities, 1967-68 increases were above increases in most earlier years.

on housing large families—would probably reduce the cost of operating public housing. According to the statistical results for the 23 cities, a reduction in the average number of minors per unit by one would lower operating costs per unit per month by about 5 dollars or about 9 percent.

Such a change, as in the case of raising rents, would involve a major alteration in the character of public housing. Consider, for example, reduction of minors per unit from 2.2 to 1.2 in the 23 cities accomplished by an increase in elderly units. This would imply a rise in the percent of units with an elderly head from the actual 32 percent to approximately 60 percent. Since some share of the additional cost per minor is due to the greater number of rooms per unit needed to accommodate these minors, the full saving could be realized only through a reduction in the number of rooms per unit as well as a shift from large to small families. Meanwhile, a policy of increasing the ratio of elderly tenants also might lower median incomes in the project. This would either increase the burden of current rent levels, or require a reduction in average rents. On the other hand, it would increase the project's eligibility to obtain supplementary payments available under present arrangements. Given the extreme changes required to bring about this result and the short duration of its effect, other alternatives for dealing with this problem seem more attractive.

A policy of *increasing federal statutory payments* or supplemental appropriations would avoid the need for greatly increasing the rent burden on the tenants, or drastically shifting the composition of the tenants. One problem such a policy raises is how to limit the size of such subsidies so they do not remove an incentive for local authorities to be efficient in managing and maintaining public housing. The findings of the present study suggest that relating the size of the subsidy in some way to general price and wage increases might go a long way toward limiting payments to cost increases which local authorities cannot control.

It is beyond the scope of this study to develop a precise formula for tying subsidies to general price and wage changes. In

broad outline, however, such a formula might involve (a) estimating a "normal" expected cost increase based on the rate of change in prices and wages, (b) estimating a "reasonable" rent increase, perhaps based on changes in tenant incomes, and (c) limiting total subsidies to the gap between "normal" costs and "reasonable" rents. The methods devised for this study could be used to estimate both the "normal" cost increase and the expected cost to the federal government of carrying out an operating subsidy policy.

This analysis of operating costs does not have direct implications for broader changes in public housing that are being discussed widely, such as policies to increase occupant ownership. However, the study may be useful in evaluating these policies compared to present ones, particularly from the standpoint of determining financial viability.

Public Housing in 23 Large Cities

The sample of cities selected was dictated by the availability of data. Since one of the goals was to compare public housing cost differences with local price differences, cities were chosen for which the Bureau of Labor Statistics collects consumer price data. The sample of cities, the average 1965-68 size of their federally-sponsored public housing stock, and their 1965 city-wide population, appears in Table 1.

In many respects, the sample is a good one for studying public housing. The cities include about 35 percent of the nation's federally-sponsored public housing. The range of local housing authority size, in terms of number of units managed, is very wide. The cities are well stratified by region, by local price and wage levels, and by many characteristics of public housing.

One characteristic limiting the universality of the study is the size of the cities. Most of them have populations of more than half a million. Public housing operating costs are usually lower in smaller communities. Doubtless this largely is because of lower prices and wage rates in smaller towns. It may be that the financial outlook for public housing in the sample cities is somewhat worse than the outlook for public housing elsewhere.

Table 1. THE SAMPLE CITIES

<u>City</u>	<u>Public Housing Stock¹ (units)</u>	<u>Total City Population 1965²</u>
1. Atlanta	8,700	535,000
2. Baltimore	10,300	925,000
3. Boston	10,600	670,000
4. Buffalo	4,300	505,000
5. Chicago	30,900	3,520,000
6. Cincinnati	5,900	495,000
7. Cleveland	7,400	855,000
8. Dallas	6,400	790,000
9. Detroit	8,200	1,660,000
10. Houston	2,600	1,100,000
11. Kansas City	2,400	530,000
12. Los Angeles	8,600	2,695,000
13. Milwaukee	2,800	765,000
14. Minneapolis	2,800	465,000
15. New York	63,100	8,080,000
16. Oakland	1,400	378,000
17. Philadelphia	13,900	2,030,000
18. Pittsburgh	9,000	560,000
19. San Francisco	5,600	745,000
20. St. Louis	7,000	710,000
21. St. Paul	2,100	308,000
22. Seattle	3,300	565,000
23. Washington	8,500	810,000

1. Public Housing stock is the 1965-68 average number of units under management in federal housing assistance programs.

2. Population estimates as of 1965 are taken from the 1966 *Commercial Atlas and Marketing Guide* of Rand McNally and Company.

PUBLIC HOUSING COSTS AND RENTS

Unit operating costs per month in the 23 local housing authorities show extremely wide variation, as displayed in Chart 2. The 1965-68 average unit costs range from under \$35 in Houston to nearly \$70 in New York and Chicago. For the individual annual totals used in the statistical analysis, the range is wider still.

Rents per unit per month also vary widely, and tend to vary with the level of costs. One of the findings, supported in detail in Part II, Chapter 4, is that the present public housing rent system as a whole works out so that rents by city are set much more in line with operating costs than with median tenant incomes. Some of the basic evidence supporting this finding is apparent in Chart 2.

The principal goal is to explain differences in operating costs, both between cities and over time. Chart 2 permits some preliminary observations relating to cost differences between cities: The lowest costs are in the 3 southern cities, Atlanta, Dallas and Houston. Since wages and prices are generally lower in the South than in the rest of the nation, this fact suggests that wage and price levels influence the level of costs. The hypothesis is strongly supported by the statistical analysis. The highest costs are in New York and Chicago. These are cities with high prices; they are also very large cities, with by far the largest local housing authorities in the nation. The question of the influence of authority size on costs will be discussed in the statistical analysis in Part II, Chapter 5.

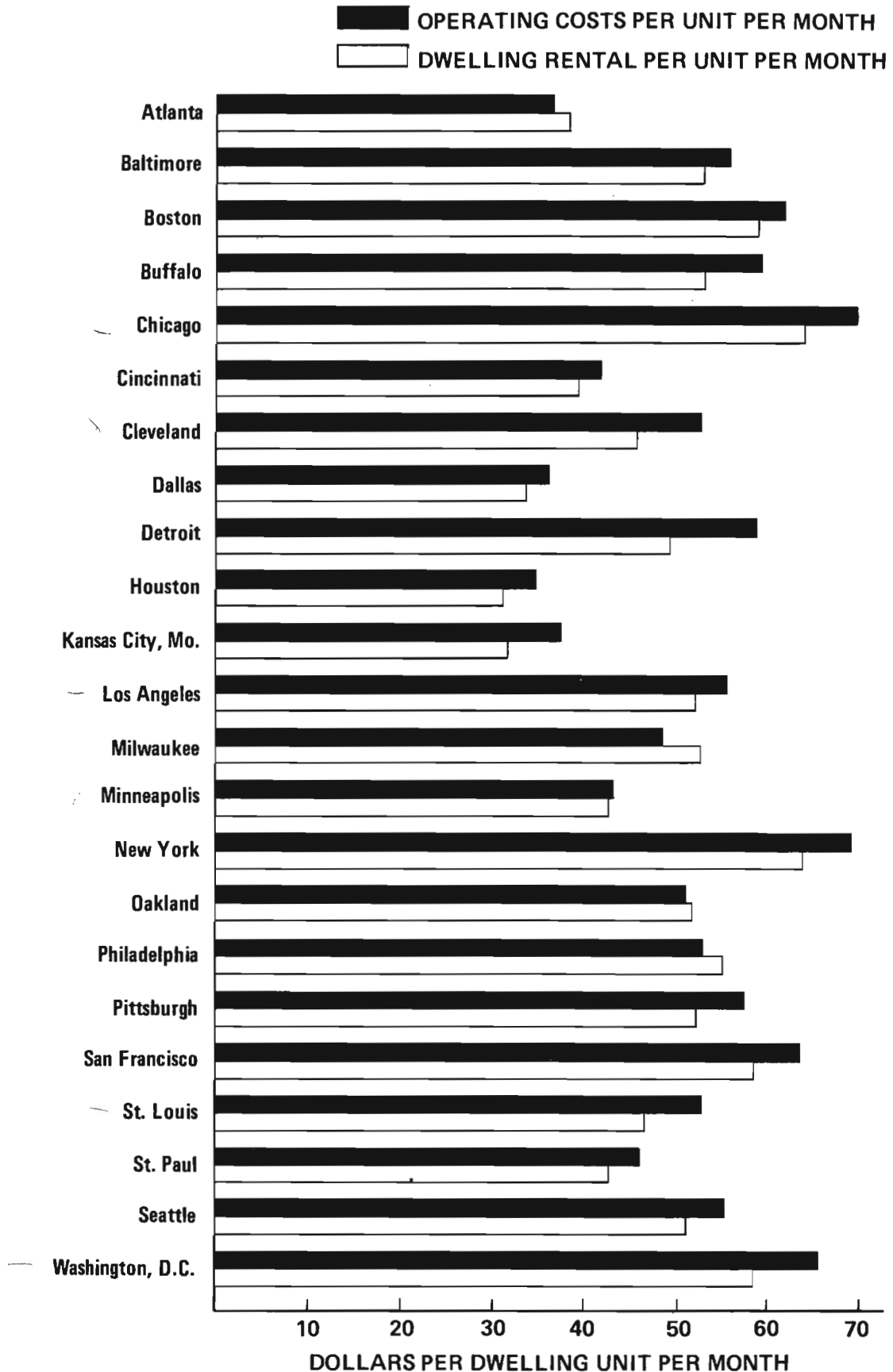
PUBLIC HOUSING CHARACTERISTICS

Within the sample cities are public housing projects with a very wide variety of building and tenant characteristics.

The average 1965-68 *age* of the public housing stock by city ranged from 9 years in Minneapolis and St. Paul to more than 20 years in Buffalo, Cleveland and Houston.

The average number of *minors per housing unit* ranged from 1.4 in Cleveland and Minneapolis, where more than half of the units are headed by elderly persons, to more than 3 in Chicago, Los Angeles, St. Louis and Washington.

**CHART 2 COSTS AND RENTS IN PUBLIC HOUSING
(1965-68 AVERAGES)**



The proportion of *families receiving public assistance* or other relief payments (not including social security) ranged from 17 percent in New York to more than 50 percent in Los Angeles, San Francisco, and Oakland.

The proportion of units occupied by nonwhites ranged from less than 25 percent in Minneapolis, St. Paul and Pittsburgh to more than 90 percent in St. Louis and Washington.

No single characteristic of the public housing stock, the tenants, or the local area bears a close relation to the level of costs. This is brought out in Charts 3 through 5, which present graphically the relationship of costs to a measure of the local municipal wage level, size of housing authority, and number of minors per unit. The technical section (Part II) provides strong statistical evidence that considering several variables jointly makes it possible to account for most of the variation in costs between cities and over time.

Chart 3: Relation of Public Housing Costs per Dwelling Unit to Average Earnings of City Employees 1965-68
1965-68 averages

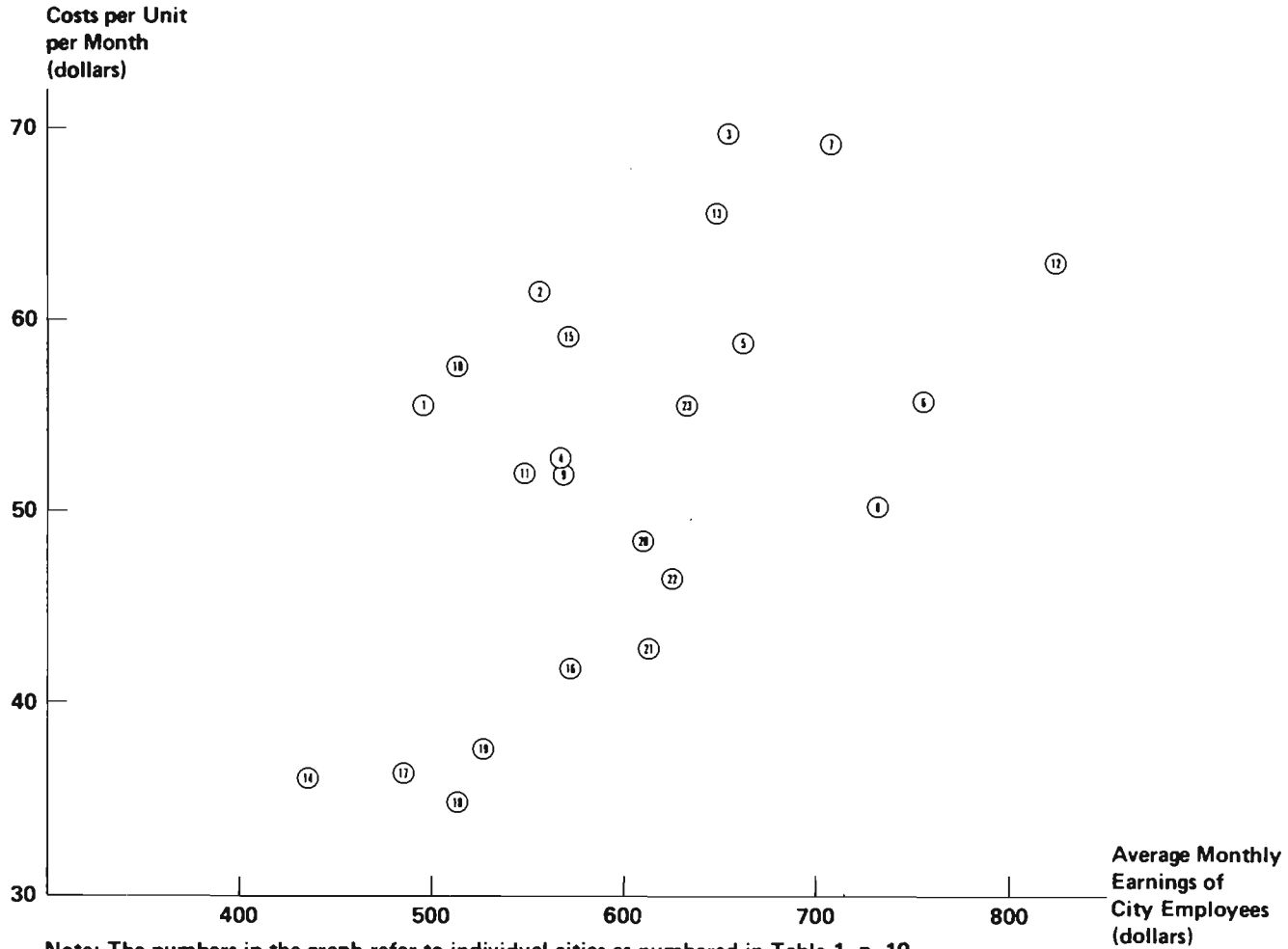
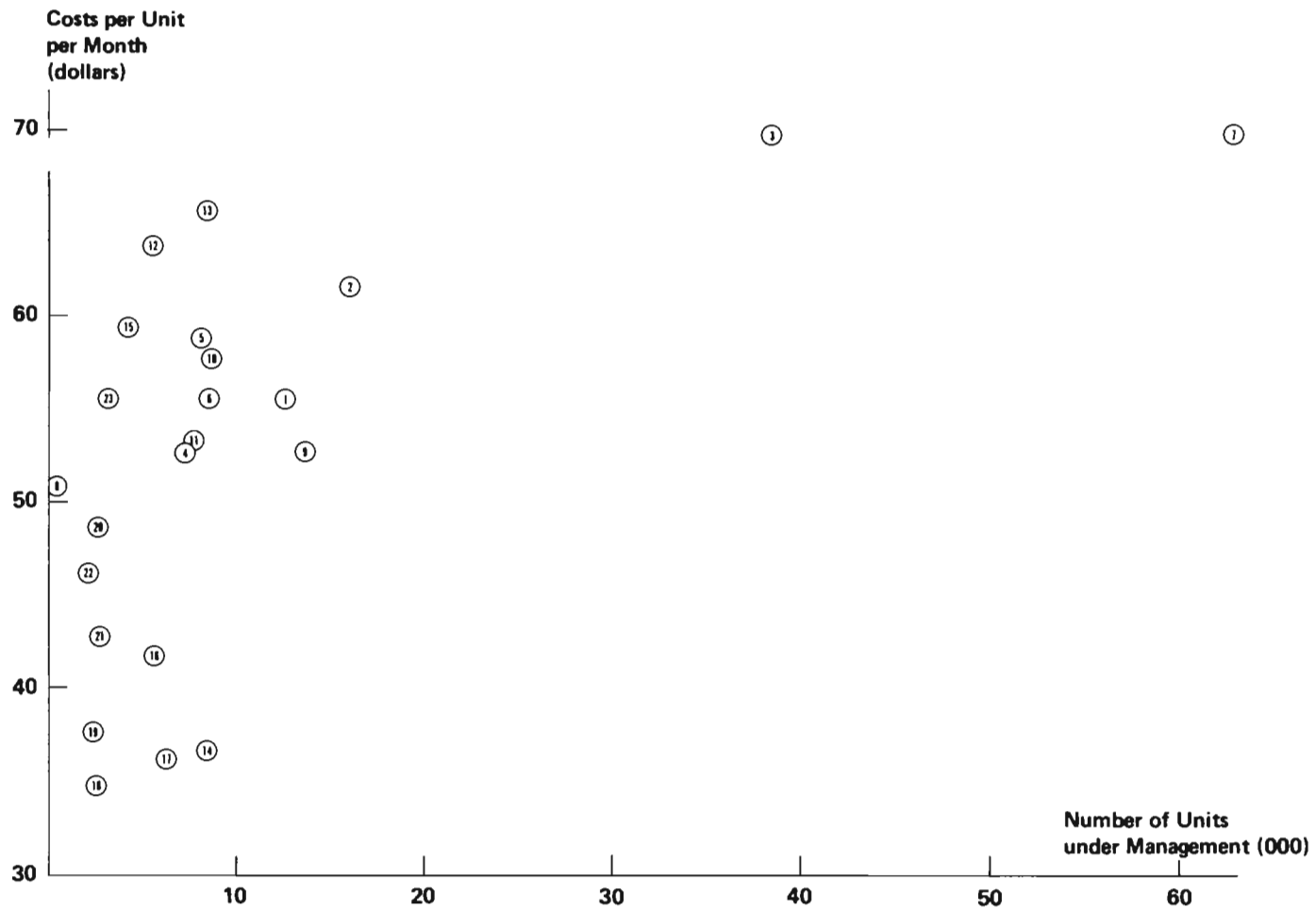
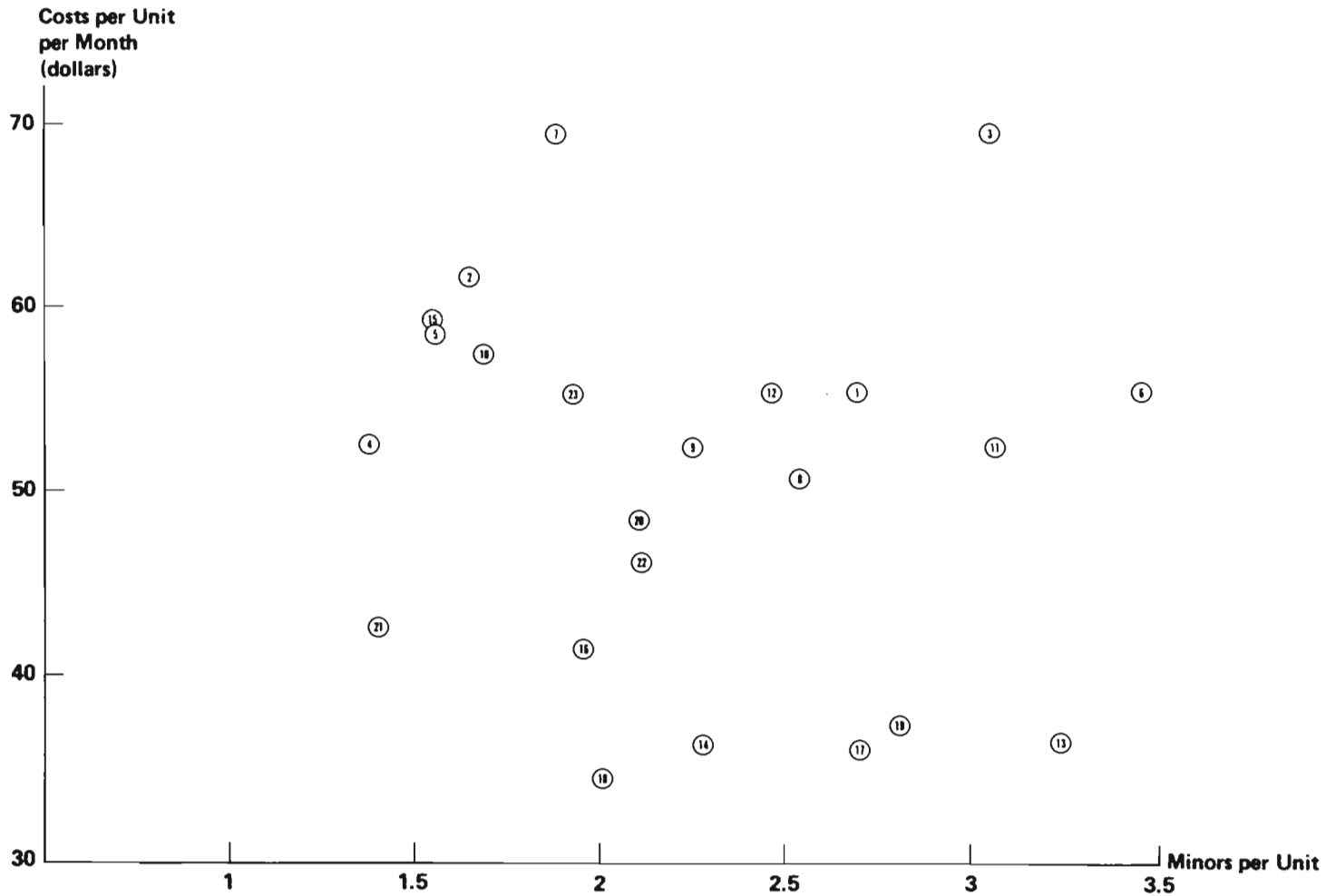


Chart 4: Relation of Public Housing Costs per Dwelling Unit to Size of Housing Authority
1965-68 averages



Note: The numbers in the graph refer to individual cities as numbered in Table 1 p. 19.

Chart 5: Relation of Public Housing Costs per Dwelling Unit to Number of Minors per Dwelling Unit
1965-68 averages



Note: The numbers in the graph refer to individual cities as numbered in Table 1, p. 19.

Current Trends in Costs and Receipts

This chapter brings together information on recent and prospective future trends in public housing operating costs and receipts. It documents, for the 23 sample cities, the rise in operating costs, the much slower rise in receipts, the probable continuing growth in the number of local housing authorities with operating deficits, and the growth in size of these deficits.

Operating costs have been rising at an accelerating rate and are unlikely to slow down until the rate of inflation in the general economy is reduced. Dwelling rentals have tended to follow trends in operating costs, but with a less than dollar-for-dollar response and after some time lag. Supplementary payments for the elderly and other groups have met some of the gap but are at present quite limited in extent.¹ Predicting with any confidence the size of future operating deficits is beyond the scope of this study. The precise dimensions of the deficits will vary according to the matching of cost trends and rent policies in many individual cities. But

1. As noted in Chapter 1, the Housing and Urban Development Act of 1969 has, since the completion of this study, opened the way to increased federal payments to meet increased operating expenses (footnote 2, page 15).

analysis of the trends does point to the probable growth of these deficits.

RECENT TRENDS IN OPERATING COSTS

An acceleration of the rise in the cost of operating public housing in recent years is apparent in Table 2. Total operating costs rose by 8.4 percent in the average city in the sample from 1967 to 1968, compared to an annual average rise of only 6.9 percent from 1965 to 1968. Among major cost components, maintenance costs rose the most rapidly both from 1967 to 1968 and over the full 1965-68 period.

For the federally-sponsored public housing of the entire United States, both the level and the rate of increase of costs per unit per month have been somewhat smaller than the average of the 23 sample cities. The acceleration of the rate of rise, however,

Table 2. THE RISE IN OPERATING COSTS IN SAMPLE CITIES
Simple Averages of 23 Cities, 1965-68

	<i>Levels of Costs</i> ¹				<i>Annual Average Percent Increase</i>	
	<i>1965</i>	<i>1966</i>	<i>1967</i>	<i>1968</i>	<i>1965-68</i>	<i>1967-68</i>
Total Operating Costs ²	47.78	49.86	53.86	58.36	6.9	8.4
Major Cost Components:						
Administrative	8.00	8.29	8.88	9.63	6.4	8.4
Maintenance ³	19.46	20.53	22.43	24.54	8.0	9.4
Utilities	11.50	11.54	11.98	12.78	3.6	6.9

1. Costs are measured in dollars per unit per month.

2. In addition to costs of administration, maintenance, and utilities, total operating costs include payments in lieu of taxes, insurance, employee benefit contributions, equipment replacement, and a number of other items.

3. Includes extraordinary maintenances.

Source: U. S. Department of Housing and Urban Development (16).

Table 3. THE NATIONAL RISE IN OPERATING COSTS
All Federally-Sponsored Public Housing
Compared with 23 Sample Cities

	<u>Level of Total Costs¹</u>	<u>Annual Average Percent Increase</u>	
		<u>1965-68</u>	<u>1967-68</u>
U.S. Average	46.68	2.9	6.6
23 City Average	58.36	6.9	8.4

1. Dollars per dwelling unit per month.

Source: U.S. Department of Housing and Urban Development (16) and U.S. Congress, *Hearings, Independent Offices and Department of Housing and Urban Development Appropriations for 1970* (8).

is even more dramatic for the national total than for the average of the 23 cities.

TRENDS IN FACTORS AFFECTING COSTS

Corresponding to the accelerating rate of rise of total operating costs is an acceleration in the principal factor accounting for cost differences, the general level of prices and wage rates. Table 4 documents the rise in consumer prices and monthly earnings of city employees for the nation as a whole through 1968. During 1969, furthermore, consumer prices again accelerated: the 1968-69 rise was 5.4 percent, compared to the 4.0 percent rise in 1967-68. While statistics on city employee earnings were not available at the time of the study, there was good reason to believe that they accelerated as well.

TRENDS IN RENTS AND TENANT INCOME

Dwelling rent charges in public housing have been rising much less rapidly than operating costs. In 1966, mean dwelling rental was equal to mean operating costs, but by 1968 mean rental was 13 per-

Table 4. THE RISE IN PRICES AND WAGES, 1965-68
U.S. Averages

	<u>Price and Wage Levels</u>				<u>Annual Average Percent Increase</u>	
	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1965-68</u>	<u>1967-68</u>
	Consumer Price Index (1957-59 = 100)	109.9	113.1	116.3	120.9	3.2	4.0
Monthly Earnings City Employees ¹	480	508	546	590	7.1	8.1

1. As of October of each year. Covers common municipal functions.

Sources: U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (4), and U.S. Census Bureau, *City Employment in 1968* (7).

cent below mean costs. In contrast to the 8.4 percent rise in operating costs from 1967 to 1968, dwelling rentals in the average of the 23 sample cities rose by only 2.9 percent from 1967 to 1968, as seen in Table 5. The 2.9 percent represented an acceleration over the full 1965-68 rise, just as the cost increase accelerated during the period. But the acceleration in rents was smaller than the normal response to cost changes. This lag suggests that rent charges are still being revised in response to past and recent cost developments.

Like dwelling rentals, the median incomes of public housing tenants in the 23 cities have been rising much less rapidly than operating costs. In fact, Table 5 indicates that the rise in median incomes was less in 1967-68 than the average for the entire 1965-68 span.¹ In part this pattern reflects turnover in public housing

1. Conclusions about income trends are subject to some uncertainty, since the income estimates for 1968 are based on data for the first three quarters of the year. This and other data limitations are discussed in the section on "Data Sources and Limitations."

tenants; economically successful families move out and poorer ones move in. Increases in the proportion of elderly families among tenants also accounts for some of the observed income patterns since elderly families (in and out of public housing) have median incomes much lower than other families. Another factor in explaining the slow rate of income growth among public housing tenants over time may well be that welfare and other income assistance payments received by many of them tend to lag behind general wage increases during inflationary periods.

Table 5. RENTS AND INCOMES IN PUBLIC HOUSING, 1965-68
Average of 23 Cities

	<i>Levels</i>				<i>Annual Average Percent Increase</i>	
	<i>1965</i>	<i>1966</i>	<i>1967</i>	<i>1968</i>	<i>1965-68</i>	<i>1967-68</i>
Mean Dwelling Rental (\$ per unit per mo.)	47.12	48.03	49.35	50.76	2.5	2.9
Median Tenant Income (\$ per year)	2,169	2,307	2,371	2,444	4.1	3.1

Source: U.S. Department of Housing and Urban Development, [15] and [16].

To have closed the dollar gap between monthly operating costs and dwelling rental charges would have required the tapping of nearly 4 percent of additional median tenant monthly income in 1968. The growth in the gap between 1967 and 1968 represented about 1.5 percent of median monthly income. Some of this gap was filled by supplementary federal payments for the elderly and other groups. The remainder was filled largely by either a drawing down of operating reserves or the incurring of operating deficits by the local authorities.

Statistical Analysis

Chapter 4

The Cost of Public Housing Operation

The operation of a housing authority in the short run can be viewed as a production process in which the output is *housing services per unit*. By housing services is meant a weighted total of quantities of space, utilities, counseling, policing, and all the other things of value a housing authority provides. The inputs required to produce these services include the stock of housing units; man hours of managerial, maintenance and other kinds of labor; and quantities of fuels, paint, and various other materials. For many purposes this is far too narrow a way of looking at a housing authority. For studying rising costs, however, it provides useful insights.

A FRAMEWORK FOR STUDYING THE COST OF HOUSING OPERATION

The cost of providing a “unit of housing services,” looked at in this way, ought to depend on a number of factors, such as costs of various labor and materials inputs, and certain characteristics of the units—age, for example. The exact form in which costs per unit is related to these other variables depends on substitution possibilities. If there is very little possibility of substitution among inputs, a lin-

ear relationship of cost per unit to input prices is appropriate. Strong substitution possibilities might make a non-linear relationship—for example, a logarithmic relationship—more appropriate.

The cost of providing a unit of housing service may also depend on characteristics of the tenants who are receiving the services. If some groups of tenants are harder on the stock of housing than others, causing larger maintenance outlays, then an increase in the proportion of tenants in these groups ought to raise costs.

An additional reason for including tenant characteristics in the analysis is that available operating cost statistics do not measure costs per unit of housing service, but rather costs per dwelling unit. The two measures differ whenever the flow of housing services is not proportional to the number of dwelling units in the stock. It seems likely that a higher number of persons per dwelling unit increases the demand for services per unit and thereby raises costs per dwelling unit. Other tenant characteristics could also affect the amount of housing services provided per dwelling unit.

The relation of costs to structural characteristics of the units also requires some elaboration. Age can be expected to increase costs because many of the subsystems of which a housing unit is made up—plumbing, wiring, flooring, and so forth—take more repair or require replacement as they get older, if the unit is to be kept in stable physical condition. If each subsystem has a predictable “cycle of deterioration and replacement,” costs ought to (a) rise with age until age equals the largest replacement cycle of any subsystem, and then (b) flatten out as age enters the range in which each subsystem repeats over and over again the cycle of deterioration and replacement. On the other hand, if the unit as a whole functions less and less reliably even with regular replacement of subsystems, costs might rise with age continuously. Both possibilities are kept in mind in the statistical testing that follows.

The effect of number of dwelling units on costs per unit (either per dwelling unit or per unit of housing service) is a question of economies of scale. If there are economies of scale, then costs per unit ought to decline with number of units under man-

agement. If there are diseconomies of large scale, costs per unit ought to rise with number of units. There seems to be no reason to expect one or another tendency to predominate; in fact, it is possible that economies of scale predominate in some size ranges and diseconomies in others.

To sum up: viewing the provision of housing services as a production process, costs per unit of housing service can be expected to depend on input costs, age of units, number of units, and certain tenant characteristics. Costs per dwelling unit (rather than per unit of housing service) ought to depend on these same variables and on any tenant characteristics which might cause variations in housing services per unit.

There are, of course, many other cost influences not covered in the list above. They will show up as errors or residuals in the statistical work below. Causes of these errors include variations in the degree of efficiency with which different housing authorities operate. They also include variations in the amount of housing services per unit which housing authorities provide. An authority may have operating costs per unit which seem exceptionally high in view of its local input costs, age, or number of minors per unit. This could be either because it operates inefficiently or because it provides extra services for the tenants.

THE VARIABLES AND SPECIFICATION OF EQUATIONS

Variables. The focus here is on the total operating costs per housing unit in the 23 housing authorities for the four years 1965 through 1968. Besides total costs per unit, four important sub-groups of costs have been analyzed, so that there are five cost variables in all:

- Ctot:* Total operating costs per housing unit for each fiscal year.
- Cadm:* Administrative costs per housing unit for each fiscal year.
- Cutil:* Utility costs per housing unit for each fiscal year.
- Crmain:* Routine maintenance costs per housing unit for each fiscal year.

Cxmain: Extraordinary maintenance costs per housing unit for each fiscal year.

The unit of measurement for all of these variables is dollars per unit per month.

One group of variables to which costs are related are local prices and wages. Four local price variables have been tested and two local wage variables, but the results presented below involve only two of the price variables and one wage variable. These are:

Ptot: The cost of living, in dollars, for a "low-budget" city worker's family.

Putil: The cost of utilities, in dollars, for a "low-budget" city worker's family.

Wgov: The average earnings, in dollars, of a full-time employee of a city government.

The first two variables were calculated by multiplying the BLS city worker "low-income budget" estimates for 1967 by consumer price and utility price indexes (relative to the 1967 indexes) for each year. The third variable refers to workers engaged in "common municipal functions," excluding education. The other variables tested but not reported below are local prices of "household furnishings and operation," local rent indexes, and local wage rates for maintenance workers. These tended to vary closely with the general price and wage variables, so that it was not possible to determine their separate effects. A positive relation of costs to all of these price variables was expected. None of them is an exact representation of prices facing a local housing authority. But between them, they probably represent fairly reliably differences between cities and over time in the cost of housing operation.

A second group of variables to which costs are related are characteristics of the stock managed by each local housing authority. Of three variables measured, the following were used in the analysis:

Units: Number of units under management.

Age: Average age of units in each city.

To calculate the second variable, expected to have a positive rela-

tion to costs, detailed information was tabulated on dates of occupancy and number of units of each housing project in each of the 23 cities for 1967. For the other years, the change in average age from 1967 was calculated by a short-cut procedure based on assumptions that no old units were retired from the stock, and that each unit added to the stock was a new one. The third variable tested but not reported was a measure of the average number of rooms per unit in each city for the single year 1967. This also was calculated by a detailed tabulation of project data in each of the 23 cities. This variable proved to be fairly closely correlated with the number of minors per unit, rendering it redundant in relationships which also included the minors per unit variable.

The final group of variables measures characteristics of the public housing tenants in each city for each year. Seven characteristics were tested, of which these four are included in results reported:

- Min:* Number of minors per housing unit.
- Relf:* Proportion of units receiving public assistance or other form of relief (not including social security).
- Nonwg:* Proportion of units with no wage-earners present.
- Nonwh:* Proportion of units in which head of the household was non-white.

For the minors variable, a positive relationship to costs can be expected, due either to higher maintenance costs for given facilities, or to more housing services per dwelling unit. For the other three variables a positive relationship might be expected on the grounds that these groups might contain more than their share of tenants with special service needs or special problems.

Two of the tenant variables tested but not reported are proportion of elderly units and number of persons per unit. Both were fairly closely correlated (one positively and one negatively) with the minors per unit variable. As such, they didn't add anything to relationships in which minors per unit appeared. Results using one of these two instead of minors per unit gave much the same overall picture as the results reported below.

Specification. In most general form, the cost relationships to be tested simply state that costs, both total and sub-groups, depend on all of the other variables. In initial testing, both a linear form of equation (implying no substitution possibilities) and a logarithmic form (implying strong substitution possibilities) gave very similar results. It was determined to use the linear form, partly because it greatly simplified analysis of the relation of sub-group cost equations to total cost equations.

Many of the variables were entered into the linear regression after multiplication by the cost-of-living variable. Thus, the number of minors per unit does not appear in the regression in simple level form, but as number of minors times the local cost of living (relative to its national mean). The reason for this adjustment is that cost of an additional minor per unit is not expected to be a fixed dollar amount, but rather a dollar amount lower in low-cost areas of the country than in high-cost areas, and an amount that rises over time as the general level of prices increases.

It is the "real cost" of an additional minor per unit, in other words, which is being tested as an influence on the "real cost" of housing operation. Multiplication of minors per unit by a general

Table 6. VARIABLES TESTED IN RELATION TO OPERATING COSTS

<u>Variable</u>	<u>Definition</u>	<u>Expected relation to operating costs</u>
P_{tot}	cost of living	positive
P_{util}	utility prices	positive
W_{gov}	government wage rates	positive
$Units \times P_{tot}/\bar{P}$ $(Units)^2 \times P_{tot}/\bar{P}$ }	number of units	unknown
$Age \times P_{tot}/\bar{P}$ $-(1 \div Age) \times P_{tot}/\bar{P}$ }	average age of units	positive
$Min \times P_{tot}/\bar{P}$	minors per unit	positive
$Relf \times P_{tot}/\bar{P}$	proportion on relief	possibly positive
$Nonwg \times P_{tot}/\bar{P}$	proportion with no wage earners	
$Nonwh \times P_{tot}/\bar{P}$	non-white proportion	positive

price index is one way of representing this idea. The variables multiplied by $Ptot/\bar{P}$ (where \bar{P} is the mean of $Ptot$ for the entire sample) before entering the regressions are the tenant characteristic variables (Min , $Relf$, $Nonwg$, and $Nonwh$) and the building characteristic variables (Age and $Units$).

In addition, nonlinear transformations were tested for the two building characteristic variables. For $Units$, both the number and the square of the number were tested, to see if there were economies of scale up to a point and diseconomies beyond that point. For Age , the level and the reciprocal of the level were tested as alternatives, to see if costs go up with age continuously, or if the age effect tends to disappear at high ages.

The final set of variables tested in linear regressions of total operating costs and cost components appears in Table 6.

Table 7. EXPLANATION OF TOTAL OPERATING COSTS PER UNIT PER MONTH¹

<u>Variable</u>	<u>Units</u>	<u>Coefficients</u>		<u>t-ratios</u>	
		(1)	(2)	(1)	(2)
$Ptot$	dollars per month	.15	-	2.9	-
$Wgov$	dollars per month	-	.038	-	3.7
$Putil$	dollars per month	.72	.96	5.1	5.1
$Age^{-1} \times (Ptot/\bar{P})$	100 \div years	-1.12	-1.32	-3.5	-4.4
$Units \times (Ptot/\bar{P})$	thousands	.46	.33	6.9	4.1
$Min \times (Ptot/\bar{P})$	number per dwelling unit	5.28	5.56	3.1	3.9
$Nonwg \times (Ptot/\bar{P})$	percentage	.30	.26	3.3	3.0
Coefficient of Determination		.73	.74	-	-
Number of Observations		92	92		

1. In this and other tables of regression results, constant terms are not shown since they have no particular importance for the present study.

THE POOLED REGRESSION RESULTS

Summary. Two multiple regressions summarize the central findings about the cost of public housing operation. In both of them, the dependent variable is total operating costs per unit, measured for each of the 23 cities for each of the four years 1965 through

1968. The coefficients, measures of significance, and goodness of fit are shown in Table 7.

The first regression includes *Ptot*, the local cost of living, as a measure of general price and wage levels. The second regression excludes *Ptot* but includes *Wgov*, the wage level of city government workers, to represent the same thing. In regressions including both *Ptot* and *Wgov*, one or the other was always insignificant and had a coefficient close to zero.¹ The same was true of regressions including the other price and wage variables mentioned above (maintenance worker wage rates, household operation prices, and private rents). Except for utility prices, the various price and wage variables tend to vary together too closely to determine their separate effects. Fortunately, the conclusions of the present study are the same whether *Ptot* or *Wgov* is taken to be the indicator of local price and wage variables.

The remainder of this section discusses the meaning of the coefficients in Table 7 and some of the alternatives tested.

Prices and Wages. The coefficient of .15 for *Ptot* means that, other factors equal, a difference of a dollar per month in the cost of living is associated with a difference of 15 cents in the cost per month of housing operation. Since the current level of the cost of living (for a "low budget" family of 4 in the 23 cities) is about \$450 per month, a price rise of 5 percent per year would lead to an expected increase in public housing costs per unit per month of about \$3.40 each year. This factor alone, in other words, seems sufficient to account for most of the current rise of \$4 to \$5 per year in public housing operation costs. The interaction of the price variable and some of the other variables increases even more the contribution of rising prices to the explanation of rising costs.

In the alternative regression equation, the coefficient of .038 for *Wgov* means that a rise of a dollar in the average monthly pay of a city government worker is associated with a rise of 3.8 cents in the cost of public housing operation. Since the current average monthly pay is about \$700, a rise at the current rate of perhaps as

1. The simple correlation coefficient between *Ptot* and *Wgov* is .80.

much as 12 percent per year leads to an expected increase in housing costs per unit per month of roughly \$3.20 per year. Again, the inflation variable seems to account for most of the observed rise.

Utility cost differences of one dollar per month are estimated to affect housing costs by slightly less than a dollar per month — 72 cents and 96 cents in the two regressions. Utility costs average only about \$25 per month and have been rising by only a percent or two per year, so their contributions to rising housing operation costs is minor.

Physical characteristics. The age variable in the regressions is 100 divided by the average age of the public housing stock. Thus, if the average age goes up from 10 years to 11 years, this variable goes down from 10 to just above 9. A change of this magnitude is estimated to increase housing operation costs by \$1.12 and \$1.32 in the two regressions. A change from 20 to 21 years would have only one fourth this effect, or about 30 cents; this is a consequence of the reciprocal form of the variable. The average age of the public housing stock in the 23 cities is about 15 years and has been rising at about .65 per year (if there were no new public housing units, it would rise at 1 per year; new units drive it below 1). Aging thus contributes something like 35 cents per year to the increase in housing costs — a significant contribution, but much less than the price variable.

The linear form of the age variable instead of the reciprocal form has very similar implications. The linear form gave a slightly worse overall fit, lending slight — but very slight — support to the notion that the rise in housing costs with age is greater in the earlier years of a building's life than in the later ones. A comparison of the regression results with alternative age variables, using *Wgov* as the local price-wage measure, is shown in Table 8.

The coefficients of .33 and .46 for the units variable in the equations of Table 7 indicate diseconomies of scale. An additional 1000 units is associated, other things being equal, with a rise of 33 and 46 cents in total costs per unit per month. The effect is statistically significant but has made only a very small contribution to the recent cost rise.

Table 8. EXPLANATION OF TOTAL COSTS:
ALTERNATIVE AGE VARIABLES

	<u>(1)</u>	<u>(2)</u>
<i>Wgov</i>	.038	.034
<i>Putil</i>	.96	.96
$(Age) \times Ptot/\bar{P}$	-	.67
$(Age^{-1}) \times Ptot/\bar{P}$	-1.32	-
$Units \times Ptot/\bar{P}$	.33	.33
$Min \times Ptot/\bar{P}$	5.56	5.23
$Nonwg \times Ptot/\bar{P}$	.26	.21
R^2	.74	.73

The introduction of the square of the number of units as an additional variable gave results which indicated that it was serving essentially as a proxy variable for New York City. New York's public housing stock (federal programs only) at the end of the 1960's included about 70,000 units, more than double the number in the next largest authority (Chicago) and about six times as many as the average for the 23 cities. The square-of-units variable, together with the units variable, indicated the opposite of a U-shaped cost curve; namely, diseconomies of scale out to about 55,000 units, and economies of scale beyond that point. Its introduction was clearly reducing the residuals for New York and only slightly modifying results for other cities. Although by statistical tests the results were significant, it was felt that they were not a reliable guide to scale effects, and the square-of-units variable was dropped.

Tenant Characteristics. The number of minors per unit has the expected positive association with costs. Its coefficients of 5.28 and 5.56 indicate that an additional minor in a unit raises its operating costs per unit per month by more than \$5. A large part of this rise seems to be due to the fact that more minors per unit are associated with more rooms per unit in public housing; as noted

earlier, the correlation between minors per unit and rooms per unit made it impossible to estimate the separate effects of additional rooms versus other ways in which minors raise costs. The number of persons per unit and the proportion of elderly units are also correlated with the number of minors per unit sufficiently so that it was not possible to estimate separate effects. The minors per unit variable, in other words, is a single measure reflecting a variety of cost influences having to do with age composition and size of units.

On the average, minors per unit have changed very little during the sample period and thus have had a negligible effect on overall costs. Apparently the effect of more public housing for the elderly, which reduces minors per unit, has been roughly balanced by an increase in family size among units with minors. For individual cities and projects, of course, changes in numbers of minors per unit probably have had dramatic cost effects.

The proportion of units with no wage earners present, *Nonwg*, is estimated to have a small effect on costs. The coefficients of .30 and .26 indicate that a one percentage point increase in this proportion (from 30 percent to 31 percent, for example) raises costs per unit per month by 26 to 30 cents. For the 23 cities as a whole, this proportion has been growing by about one percentage point per year, and has thus made a small contribution to the overall cost rise.

The effect of *Nonwg* on costs probably represents the greater proportion of persons in this group than among public housing tenants as a whole who require special services or who cause special maintenance problems. For two other tenant characteristics — the proportion receiving relief, *Relf*, and the nonwhite proportion, *Nonwh* — there did not appear to be significant cost-raising effects of this kind. A comparison of regression results with each of these three variables appears in Table 9.

These results cast doubt on the relevance of *Relf* and *Nonwh* to explaining costs. The coefficients of *Relf* and *Nonwh* are much smaller than the *Nonwg* coefficient, and they are not statistically

Table 9. EXPLANATION OF TOTAL COSTS:
ALTERNATIVE TENANT CHARACTERISTICS

	<u>coefficients</u>					
	(1)	(2)	(3)	(1)	(2)	(3)
<i>Ptot</i>	.15	.31	.28	2.9	6.9	8.8
<i>Putil</i>	.72	.54	.63	5.1	3.4	4.4
$(Age^{-1}) \times Ptot/\bar{P}$	-1.12	-.73	-.58	-3.5	-2.2	-1.6
$Units \times Ptot/\bar{P}$	.46	.31	.30	6.9	4.6	4.5
$Min \times Ptot/\bar{P}$	5.28	1.35	-.71	3.1	1.1	-.4
$Nonwg \times Ptot/\bar{P}$	.30	-	-	3.3	-	-
$Relf \times Ptot/\bar{P}$	-	-.10	-	-	-1.1	-
$Nonwh \times Ptot/\bar{P}$	-	-	.07	-	-	1.5
R^2	.73	.69	.70	-	-	-

significant. The *Relf* coefficient, furthermore, has an unexpected negative sign. *Nonwh* is fairly closely correlated with *Min* (the simple correlation coefficient is +.69) and so in the regression including *Nonwh* and *Min* the latter variable also drops to insignificance. Regressions including both *Nonwg* and one of the other tenant characteristics suffer from most of these same statistical difficulties.

SOME CHECKS ON THE POOLED REGRESSION RESULTS

Confidence in the validity of the regression results above is strengthened by (1) examining regression results for the main components of costs, and (2) examining separately regression results across the 23 cities and regression results over the four years for each city. The first check permits judgment as to whether particular explanatory variables significantly affect the cost components to which they are most relevant — for example, whether utility prices affect utility costs. The second check establishes whether there is a problem of separating short-run forces, expected to be especially important in year-to-year differences,

from long-run forces, which can be assumed to carry greater weight in cross-city differences.

In addition to these checks, regression results are presented excluding New York City from the sample, since New York public housing represents an extreme observation for many of the variables in the study.

The components of total operating costs. Four major components of cost — administrative costs, utilities costs, routine maintenance costs, and extraordinary maintenance costs¹ — account for about 80 percent of total operating costs. In general, these cost components ought to be related to the variables which explain total costs. Indeed, as a matter of arithmetic, regressions of *all* cost components on all of the explanatory variables in the main regressions above would give coefficients which add up to the coefficients in the total cost regressions. The value of examining the cost components is to determine whether particular components are related to the particular variables that seem most likely to affect them.

Among variables which contribute to explaining total costs, the general price or wage variables ought to affect all of the components. Utility prices ought to have an important effect on utility costs. Age ought to have an important effect on maintenance costs. Tenant characteristics ought to affect especially management and maintenance costs. It is not clear which components ought to be affected by the number of units.

Results of regressions for the cost components appear in Table 10. All of the variables are tested for all of the components, with the exception of utility prices, which appear only in the utility cost regression.

Reading across the coefficients of P_{tot} , it is evident that the only unexpected one is the small negative coefficient for extraordinary maintenance, and that the significant ones are positive

1. The separation of routine maintenance costs from extraordinary maintenance costs in public housing cost accounting is based on their frequency. Regularly recurring costs, such as painting or replacing light bulbs, are routine; infrequent costs, such as replacing boilers, are extraordinary.

Table 10. EXPLANATIONS OF THE MAIN COMPONENTS OF TOTAL COSTS

	<i>Coefficients</i>					<i>t-ratios</i>				
	<i>Admin. Costs</i>	<i>Util. Costs</i>	<i>Maintenance Costs</i>			<i>Admin. Costs</i>	<i>Util. Costs</i>	<i>Maintenance Costs</i>		
			<i>Rou- tine</i>	<i>Extra- ordinary</i>	<i>Total</i>			<i>Rou- tine</i>	<i>Extra- ordinary</i>	<i>Total</i>
<i>Ptot</i>	.02	.02	.12	-.02	.10	2.1	.9	5.2	-.9	3.7
<i>Putil</i>	-	.43	-	-	-	-	6.6	-	-	-
<i>Age</i> ⁻¹ × <i>Ptot</i> / \bar{P}	-.07	-.27	-.18	-.20	-.38	-1.0	-1.9	-1.2	-1.7	-2.1
<i>Units</i> × <i>Ptot</i> / \bar{P}	.07	.04	.24	.30	.27	4.9	1.2	7.6	1.1	6.9
<i>Min</i> × <i>Ptot</i> / \bar{P}	1.31	.58	1.38	.04	1.42	3.9	.6	1.9	.1	1.6
<i>Nonwg</i> × <i>Ptot</i> / \bar{P}	.04	.02	.03	.08	.11	2.0	.6	.8	2.3	2.1
<i>R</i> ²	.54	.48	.71	.14	.63	-	-	-	-	-

coefficients for administrative costs and for routine and total maintenance costs. Utility prices, as expected, have a significant positive effect on operating expenditures for utilities.

Among building characteristics, age has the largest and most significant effect on total maintenance costs. The number of units is estimated to affect all cost components positively, but especially routine and total maintenance costs.

Among tenant characteristics, minors per unit has its largest effect on administrative costs and on routine and total maintenance costs. The effect on administrative cost is much more significant statistically. Finally, the proportion of families with no wage earners significantly affects administrative costs and extraordinary and total maintenance costs.

A few of the results in the table are surprising; for example, the effect of age on utility costs. But some random surprises are to be expected in a statistical analysis, and the results in general lend support to the validity of the results for total costs.

In a further investigation of the behavior of individual cost components, an attempt was made to separate the increase in the labor component of maintenance costs into increases in number of employees and increases in wages per employee. The underlying idea was that if the rise was due mainly to rising wage rates, the case for an inflation explanation of rising costs would be strengthened; whereas if number of employees per unit had grown more than wage rates, alternative explanations would be more plausible. It proved very difficult to obtain data on numbers of employees, however, so the analysis was carried out only for two cities, Washington and Baltimore, and was based on budget requests each year rather than actual numbers of persons employed. For these two cases, the rise in wage rates clearly was much more important than the rise in numbers of employees per unit. This result lends some additional support to the importance of inflationary trends in explaining rising costs.

Differences Across Cities and Over Time. For each city, the four years of data for each variable can be separated into (a) a four-year

average and (b) each year's deviations from the four-year average. By running separate regressions on the city averages and on the deviations from the average, it can be determined whether there are important differences in regression results for these two kinds of variation. Forces which are especially important in the short run would be expected to have larger coefficients in the regressions over time than in the ones for city averages. Forces which operate with a lag and are therefore important only in the long run would be expected to have larger coefficients in the regressions for city averages. Table 11 compares results for the pooled regressions, the

Table 11. TOTAL COSTS: REGRESSION RESULTS FOR POOLED OBSERVATIONS, 4-YEAR AVERAGES AND DEVIATIONS FROM 4-YEAR AVERAGES

	Coefficients			t-ratios		
	<i>Pooled</i>	<i>Aver-</i> <i>ages</i>	<i>Devia-</i> <i>tions</i>	<i>Pooled</i>	<i>Aver-</i> <i>ages</i>	<i>Devia-</i> <i>tions</i>
<i>Ptot</i>	.15	.16	.14	2.9	1.2	2.2
<i>Putil</i>	.72	.73	.76	5.1	2.5	.6
$Age^{-1} \times (Ptot/\bar{P})$	-1.12	-1.18	-1.60	-3.5	-1.8	-1.9
$Units \times (Ptot/\bar{P})$	.46	.46	.38	6.9	3.3	1.6
$Min \times (Ptot/\bar{P})$	5.28	5.18	8.63	3.1	1.4	2.3
$Nonwg \times (Ptot/\bar{P})$	.30	.30	.27	3.3	1.4	1.4
R^2	.73	.73	.72	-	-	-

city four-year averages, and the deviations from four-year averages, using *Ptot* to represent the general level of prices and wages.

In no case are coefficients for the averages or for the deviations significantly different from the pooled results. The closest to a significant difference is the minors per unit variable, which is estimated to be more important in explaining differences over time than differences between cities. The similarity of the price coefficients in all three regressions is striking.

The significance levels are lower for the averages and the deviations than for the pooled results. Since the city average regression contains only 23 observations, wider confidence limits than for the 92 pooled observations are to be expected. It is interesting that the variables which seem most significant in accounting for differences over time are the price level and the number of minors per unit.

Results Excluding New York City. Since New York's public housing is an extreme observation for many of the variables of interest here, it is of interest to see how much the central results of the study are changed excluding New York from the sample. Table 12 compares regression results including and excluding New York, with P_{tot} representing general price and wage levels.

The general results are affected little by excluding New York. The main differences are a larger coefficient for the number of units, and a smaller one for minors per unit, when New York is excluded. Apparently public housing operating costs are not as high in New York as would be predicted by extrapolating the cost-units relation for other cities to 70,000 units; nor are costs as low as would be expected on the basis of New York's smaller-than-average number of minors per unit.

Table 12. TOTAL COSTS: RESULTS WITH AND WITHOUT NEW YORK

	<i>Coefficients</i>		<i>t-ratios</i>	
	<i>Including New York</i>	<i>Excluding New York</i>	<i>Including New York</i>	<i>Excluding New York</i>
P_{tot}	.15	.17	2.9	3.5
P_{util}	.72	.57	5.1	4.0
$Age^{-1} \times P_{tot}/\bar{P}$	-1.12	-.84	-3.5	-2.6
$Units \times P_{tot}/\bar{P}$	.46	.80	6.9	6.6
$Min \times P_{tot}/\bar{P}$	5.28	3.12	3.1	1.8
$Nonwg \times P_{tot}/\bar{P}$	.30	.27	3.3	3.0
R^2	.73	.73	-	-

THE RESIDUALS

While the variables measured can account for nearly three-quarters of the variance in costs between cities and over time, there are residual or unexplained cost differences which average about \$6.50 per unit per month. It is easy to think of reasons for the residuals. Errors in measurement are undoubtedly present in the price, wage, and tenant characteristic variables. A number of variables, even if they are measured without error, differ in concept or in detailed composition from what would be the ideal for a study such as this. Finally, and perhaps most important, no attempt has been made to measure either relative efficiency of various housing authorities, or differences in the kinds and amounts of services provided by different authorities.

Among cities, the ones with high residuals and the ones with low residuals tend to vary somewhat from one regression equation to another. Generally, Buffalo, Pittsburgh, and Washington tend to have high positive residuals—that is, costs per unit per month in those cities are fairly consistently higher than would be expected on the basis of local costs, building characteristics, and tenant characteristics. Costs in Dallas, Houston, and Oakland are fairly consistently lower than would be expected.

Over time, there does not seem to be any tendency for the average residual to change in size. In the regression using P_{tot} as the general price level variable, there are 13 negative and 10 positive residuals for 1965, and also 13 negative and 10 positive residuals for 1968. The absence of a trend in the residuals suggests that there has probably been no major change over time in the “omitted” variables as a group. Had a decrease in efficiency been a major cause of rising costs in recent years, for example, it probably would have been reflected in a trend from low to high residuals during the four years.

THE DETERMINANTS OF COST INCREASES

The important factors accounting for cost changes, according to the analysis presented above, are price and wage changes, number

and age of housing units, number of minors per unit (an alternative measure of age composition and persons per unit), and proportion of families with no wage earners. How these factors contribute specifically to the rise in public housing costs from 1965 to 1968 is considered next.

A convenient summary of the implications of the analysis for the rise in public housing costs is Table 13. It shows the change from 1965 to 1968, averaging over the 23 cities, for total costs and for each of the major explanatory factors. It then shows the contribution of each factor to the 1965-68 change by multiplying the change in each factor by its coefficient in the regressions discussed earlier. The results in the table use P_{tot} as the measure of general price and wage levels.

Table 13 makes clear that price variables dominate the explanation of the rise in costs. Increases in city cost-of-living measures directly account for nearly three-fifths of the rise in costs, and their interaction with other characteristics (for example, the fact that the cost of a year's aging increases as general costs go up) adds another fifth. Utility prices account for an additional 4 percent of the overall rise. Using local government wage rates instead of the cost of living as the indicator of price and wage levels leads to much the same conclusion.

In contrast, physical characteristics and tenant characteristics appear to contribute little to the general cost rise. Of course, in individual projects, the age, number of minors per unit, or other factors may be extremely important. The age variable contributes nearly one-tenth of the total rise in costs, and the two tenant characteristics together contribute less than one-tenth. The units variable, finally, adds only 4 percent to the cost increase.

There are many uncertainties about the detailed results of the cost analysis. The sample of cities may be atypical in some respects, some of the variables undoubtedly contain errors of measurement, some of the correlations may be partly spurious, and so forth. But there is such strong support for the main conclusion that it seems quite certain that rising prices and wages, not chang-

ing building or tenant characteristics, account for the bulk of the rise in public housing operating costs.

Table 13. EXPLANATION OF 1965-68 RISE IN
PUBLIC HOUSING OPERATING COSTS,
23 CITIES

	<i>1965-58 change (Average of 23 cities)</i>	<i>co- efficient</i>	<i>contribution to the rise in total cost</i>
Costs per Unit per Month (\$s)	10.57	-	-
General Cost of Living (\$s per month)	40.32	.15	\$6.05
Utility Price (per month)	.64	.72	.46
Age of Stock (years)	1.95	.50 ¹	.98
Units in Stock (000 Units)	1.05	.46	.48
Minors per Unit (Number)	.05	5.28	.26
Units with no wage earner (Percentage)	2.36	.30	.71
Interaction of price level and other characteristics ²			2.29
Total	-	-	\$11.23 ³

1. In the regression, the reciprocal of age times 100 (rather than age itself) was a variable. The regression coefficient of -1.12 is here converted to a linear form, valid for average ages of approximately 15 years.

2. In the regression the physical characteristic variables and tenant characteristic variables were multiplied by the general price level. The contribution of these variables to rising costs thus depends on (a) their own increase and (b) the increase in the price level. These two effects have been separated, the latter being reported under "interaction of price level and other characteristics."

3. The total "explanation," \$11.23, differs slightly from the total cost rise, \$10.57, because of regression errors and the approximations described in notes 1 and 2.

Rent Relationships in Public Housing

This chapter isolates major influences affecting public housing rents per unit. From month to month, changes in incomes, certain tenant characteristics, and vacancies are among the important ones. There are, of course, a great many regulations and administrative decisions which affect rents. From year to year, local authorities may change rent schedules and, less frequently, change systems of charging rents. Underlying the entire structure are the guidelines provided in basic housing legislation. This chapter is an attempt to characterize, in terms of a few quantitative generalizations, how the whole rent system has tended to work out in the sample cities during recent years.

SUMMARY

Two simple conclusions emerge from this study. *First*, except in the short run, it appears that rents per unit per month vary mainly with variations in routine costs per unit per month. Authorities with high costs tend to have high rents; those with low costs, low rents. The importance of all other variables tested, including median incomes of tenants, is transitory and small compared with

the role of costs per unit per month. Apparently the automatic income-rent link which exists at any one moment of time in many (but not all) local housing authorities is offset to a sufficient degree by changes in rent schedules and other factors, so that in the 23 cities and 4 years as a whole, rents do not follow median incomes at all closely but tend instead to vary with costs.

Second, while rents tend to vary with costs, the response is less than dollar-for-dollar. An increase of a dollar per unit per month in routine costs is associated with a rise of only about 75 cents per unit per month in rents, and even this 75-cent response occurs after a lag. If this is an accurate generalization about the present public housing rent system as a whole, then it follows that under this system future cost increases will be only partly offset by rent increases and therefore will lead to increasing deficits. The implications of this finding are discussed in Part I.

The statistical analysis which underlies the two main conclusions about the present rent system as a whole is presented next. However, it may be helpful before proceeding with this to deal with one basic question about the interpretation of the rent results.

The question which the summary naturally suggests is this: Are costs influencing rents, or are rents influencing costs? The previous discussion was based on the premise that an increase in costs causes a local housing authority to alter its rent schedules or regulations in such a way as to raise rental receipts. Is it not equally plausible to suppose that a rise in rental receipts, from whatever source, frees an authority from spending constraints and causes a rise in operating expenditure?

Support for the first interpretation – that costs influence rents rather than the other way around – comes from the fact that it is possible to account for a large proportion of the variance in costs in a highly plausible way without any reference to rental receipts. If changes in rents were exerting major influences on costs, it would not be possible to observe the relationships of costs to wage rates, to local price levels, to number of minors per unit, and

to the other influences already documented. The finding that these influences are significant seems to rule out the rents-to-costs interpretation as the dominant one. But since the cost analysis of the previous chapter leaves substantial unexplained variation for some cities, the rents-to-cost interpretation cannot be given a weight of zero. There may, in other words, be some bias in the rent relationships analyzed below which works in the direction of over-emphasizing the importance of the cost variable.

STATISTICAL ANALYSIS

Variables. Dwelling rental per unit per month, as recorded in the financial reports that local housing authorities submit to HUD each fiscal year [16], is the variable under focus here. Within the sample of 23 cities during the four years, this figure varies greatly, from \$29 (Houston, in 1965) at one extreme to \$68 (New York in 1968) at the other. One characteristic of this variable which is perhaps not obvious from the definition is that it varies automatically with the occupancy rate in a city's public housing, since the number of units by which rental receipts are divided is the total number under management rather than the number of occupied units. Occupancy rates in public housing were very high in almost all of the sample observations, however, so that this characteristic should have little effect on the statistical results. One exception is St. Louis, which apparently has had an occupancy rate below 90 percent in recent years in contrast to the typical 95 percent or higher.

Rents per unit per month were analyzed in relation to four other variables. The first three are variables which basic public housing law suggests ought to be important ones; namely, routine costs per unit per month, median tenant incomes, and the level of private rents in each city. The fourth is a tenant characteristic which a study of rent-income ratios in the Detroit local housing authority [17] suggested was important; namely the proportion of units headed by an elderly person. Some other tenant characteristics were tested as well; but they all proved to be unimportant

in the type of aggregate rent relationships under investigation here.

Routine costs per unit per month ought to affect rents positively, since financial solvency is one of the criteria local housing authorities bear in mind in setting rent regulations and schedules. Routine rather than total costs were tested on the grounds that the extraordinary expenses of a particular year seem much less likely to affect rent schedules than the normal costs of payrolls, utilities, insurance and so forth. The distribution between routine costs and non-routine costs in public housing accounting is based on whether an item is a regularly recurring expense or an unusual outlay taking place only infrequently.

Median tenant income ought to affect rents positively since many local housing authorities relate rental charges to tenant incomes. Unfortunately, median tenant income, the only income variable available for the sample of 23 cities and 4 years, is not the ideal income variable for this study. It is based on re-examinations of tenants and thus does not take account of differences between incomes of new occupants and those subject to re-examination. Another problem is that the income figures are medians while the rent figures are means. For these and perhaps other reasons, there is probably some understatement of the strength of the income-rent relationship in the results reported below.

The median income figures tested do not take account of the special deductions or other provisions which many housing authorities permit in calculating the rent a public housing tenant pays. This, however, is not a disadvantage from the point of view of this study. Interest here is in whether income as normally defined has an effect on rents paid. If the system of deductions and other regulations makes the income-rent connection very weak, that is the major point of significance, not a determination of the factors which weaken the relationship.

The *level of private rents* ought to affect public housing rents, because the upper limit on public housing rents is set at 80 percent of the local rent level for comparable private units. The private rent figures are the "low-budget" rental costs reported in the BLS city-

worker budget study for 1967 [6], multiplied by the rent index component of the local consumer price index (relative to its 1967 level).

The *proportion of units with an elderly head* was found to have a positive effect on rents, given income and other factors in the Detroit study cited above. The main reason appears to be that the system of deductions and exclusions works against those with few dependents and with a stable source of income such as social security payments. The elderly proportion was multiplied by median income before testing its relation to rents. The effect of a one percent increase in the elderly proportion on the dollar amount of rent ought to depend on general levels of prices, incomes, and welfare payments; and multiplication by income is one way — not the only way or necessarily the best way — to express this dependence.

The Regression Results. For the 92 observations consisting of each of the 23 cities for each of the 4 years, Table 14 presents the results of a linear multiple regression of public housing rents per unit per month on the other four variables.¹

By far the largest and most significant coefficient is the one for routine costs. Since all dollar variables are expressed as dollars

Table 14. EXPLANATION OF DWELLING RENT
PER UNIT PER MONTH

<u>Variable</u>	<u>Coefficient</u>	<u>t-ratio</u>
Routine costs	.662	9.4
Private rent level	.097	1.9
Median tenant income	.022	1.8
Elderly proportion × income	.043	2.0
R ²		.84

1. The constant term in the regression is not shown in Table 14 or the other tables of regression results.

per month, the coefficient of .662 means that a dollar increase in routine costs is associated with a 66-cent increase in average rent. The increase is positive as expected, but it is well below one, implying that rent increases under the present system of rents tend not to cover cost increases fully.

The other coefficients are positive as expected; but they are much smaller and much less significant than the coefficient of routine costs. The private rent coefficient of .097 implies that a dollar increase in "low-budget" private rents per month leads, on the average, to an increase of only 9.7 cents in public housing rents. The response of rents to the income and elderly variables is even smaller and again not very significant.

Why does the income-rent relation turn out to be so weak? There are several possibilities. One is that the statistical shortcomings of the income variable discussed earlier bias the results in the direction of a small and insignificant coefficient. A second possibility is that the deductions and exemptions in many local housing authority rent systems and the existence of flat per-room charges in a number of others greatly weakens the income-rent relationship. The most likely possibility is that in the recent period of growing cost pressures, local authorities, concentrating on trying to adjust rents to cover costs, have relegated income to a more passive role. If tenant incomes rise significantly during a period of severe cost pressures, this argument holds that this rise triggers no special action by the local authorities. If tenant incomes do not rise at such times, however, then local authorities may feel compelled to revise rent schedules. The true relation then appears to be between rents and costs, not between rents and income.

The pooled regression results of Table 14 reflect both differences between cities and differences over time. Table 15 separates these two kinds of change by presenting regressions based on 4-year averages and regressions based on deviations from 4-year averages. The 4-year average regressions tend to measure long-run effects, and the deviations tend to measure short-run forces.

The 4-year average relation to routine costs is higher than the

Table 15. DWELLING RENTS – 4-YEAR AVERAGES
AND DEVIATIONS FROM AVERAGE

<i>Variable</i>	<i>Coefficients</i>			<i>t-ratios</i>		
	<i>4-Year Avg.</i>	<i>Deviations</i>		<i>4-Year Avg.</i>	<i>Deviations</i>	
		(a)	(b)		(a)	(b)
Routine Costs	.744	.065	.228	5.5	.9	3.8
Private Rents	.104	.394	-	1.1	3.4	-
Median Income	.015	.023	.033	.6	1.8	2.6
Elderly Proportion × Income	.054	.013	.020	1.3	.6	.9
R ²	-	-	-	.89	.50	.44

pooled relation, but still below one. In the two relationships shown for deviations from 4-year averages (one including and one omitting the private rent variable), the coefficient for routine costs is far lower than in the pooled results. Evidently the relation of rents to costs is one that takes some time to adjust.

The relation to private rents is about the same for city averages as for the pooled results, and not significant in either case. Private rents show up as a surprisingly important influence in the first regression, based on deviations from 4-year averages. Possibly a sharp rise in private rents makes public housing attractive to those with incomes above the public housing norm; if they then move into, or are not compelled to move out of, public housing, rental receipts in public housing may go up.

The second regression based on deviations from 4-year averages is consistent with this substitution hypothesis about private and public housing. Since the hypothesis involves changes in income of public housing tenants as a link between higher private rents and increases in public housing rents, it can be expected (if the hypothesis is true) that omitting the private rent variable from the regression would cause the income variable to become more important and statistically significant. This is the outcome

of the final regression; it is the only one in which the income variable is a significant one. Even here, however, the coefficient of .033 implies a very weak response of rent to income.

The substitution hypothesis is at best a minor qualification of the central finding that under the present public housing rent system as a whole, rents vary mainly with costs.

Data Sources and Limitations

A brief description of data sources and their limitations is helpful in judging the reliability of the study's results.

The basic cost and rent data come from annual reports submitted to the Department of Housing and Urban Development (HUD) by each local housing authority [16]. Data on number of units under management come from the same source. These data follow uniform accounting procedures and are probably the most accurate in the study. There are, however, differences between cities in the time-span covered by each year's data, since different authorities report according to different fiscal years.

The price and wage data came from three principal sources: Bureau of Labor Statistics consumer price indexes for the 23 cities [4], BLS studies of 1967 city-worker family budgets by city [5 and 6], and Census Bureau surveys of employment and payrolls of city workers, also by city [7]. The most important limitations of these data are probably conceptual ones; since they are collected for purposes other than studies of housing costs, they do not match the precise concepts or cover the exact items that would be

best suited to the present study. Thus, the consumer price indexes and their components (of which utility prices are used especially heavily in this study) indicate broadly which cities have low prices and which ones have high prices. But they do not refer to the precise items which housing authorities purchase in operating public housing. Similarly, the monthly earnings of employees in "common municipal functions" indicate broadly where city wage rates are low and where they are high. But they do not refer specifically to the wage rates of employees of local housing authorities.

The data on tenant characteristics (including income) are based on re-examinations of tenants in public housing, conducted by each local authority and tabulated by HUD [15].¹ They are subject to significant margins of error for purposes of this study for several reasons. They do not cover tenants newly admitted to public housing during each year. Therefore, they do not reflect differences between the average characteristics of new tenants and other tenants. Elderly tenants are not necessarily re-examined during each year of occupancy, so there is some under-weighting of elderly characteristics and some variability in the degree of this under-weighting from year to year. Finally, all tenant data for 1968 were based on only the first three quarters, since re-examinations conducted during the final quarter were not yet tabulated at the time the study was conducted.

Because of these known shortcomings in the tenant characteristics data, reported values for a few characteristics in about half a dozen of the 92 observations² were edited before the beginning of the statistical analysis. Items edited were those which met two conditions: (a) they were far out of line with tenant characteristics in the same city in adjacent years, and (b) the number of tenant re-examinations on which they were based was significantly below the total number of units under management. Some unpublished data on tenant characteristics made available

1. These reports are not published, but some tabulations based on them appear in [11], [12], and [13].

2. The 92 observations cover 23 cities for 4 years.

by NAHRO [14] also were helpful in spotting questionable tenant characteristic estimates. The method of editing these items was to replace them with linear interpolations based on the same city in adjacent years.

The data on age of the public housing stock in each city were based on a HUD listing of the first month of full occupancy of each project in each of the 23 cities [10]. The listing referred to mid-1967; data for other years were estimated by a short-cut procedure based on the number of units added to each city's public housing stock in each year.

References

PUBLICATIONS

1. National Commission on Urban Problems, *Building the American City*, GPO, 1968, pp. 108-133, 188, 190.
2. President's Committee on Urban Housing, *A Decent Home: Report of the President's Committee on Urban Housing*, 1968, pp. 60-61, 68-73.
3. President's Committee on Urban Housing, *Technical Studies, Volume 1*, pp. 147-165 (von Furstenberg and Moskof, "Federally Assisted Housing Programs: Which Income Groups Have They Served or Whom Can They be Expected to Serve?").
4. U. S. Bureau of Labor Statistics, *Handbook of Labor Statistics*, GPO, 1968.
5. U. S. Bureau of Labor Statistics, *Pricing Procedures, Specifications, and Average Prices Used for the City Worker's Budget*, bulletin 1570-3; GPO, 1968.
6. U. S. Bureau of Labor Statistics, *Three Standards of Living for an Urban Family of Four Persons; Spring 1967*, bulletin 1570-5; GPO, 1968.
7. U. S. Census Bureau, *City Employment in 1968* (GE 68 No. 2), Washington, May 1969.

8. U. S. Congress, Subcommittee of House Appropriations Committee, *Hearings, Independent Offices and Department of Housing and Urban Development Appropriations for 1970*, Part IV, pp. 235-273; GPO, 1969.
9. U. S. Department of Housing and Urban Development and predecessor agencies, *Annual Reports*.
10. U. S. Department of Housing and Urban Development, Housing Assistance Administration, "Consolidated Development Directory, June 30, 1967."
11. U. S. Department of Housing and Urban Development, Housing Assistance Administration, *Statistics on Low-Rent Housing: Families Moving into Low-Rent Housing, Calendar Year 1966*, Washington, 1968.
12. U. S. Department of Housing and Urban Development, Housing Assistance Administration, *Statistics on Low-Rent Housing, Families Re-Examined During Calendar Year 1966 for Continued Occupancy*, Washington, 1968.
13. U. S. Department of Housing and Urban Development, *Statistical Yearbook*, 1966.

UNPUBLISHED SOURCES

14. National Association of Housing and Redevelopment Officials, unpublished tabulations of tenant characteristics in public housing, selected cities.
15. U. S. Department of Housing and Urban Development, quarterly tabulations of characteristics of families re-examined for continued occupancy in public housing, by Local Authority.
16. U. S. Department of Housing and Urban Development, annual "Trend Statement of Operating Receipts, Expenditures, Residual Receipts and Operating Reserve," by Local Authority.
17. Von Furstenberg, George M., "Factors Affecting the Ratio of Rent to Total Family Income: An Empirical Exploration for Detroit, 1967."

A DIRECTORY OF UNIVERSITY URBAN RESEARCH CENTERS
141 pages, SBN 87766-000-X, \$3.50, paper

University urban research centers now number close to 200. This directory provides detailed information on their purposes, past and current projects, staff size, relationship to their universities, sources of support, fields of research and publications. A unique feature is an introductory essay describing how four research centers, each in a different way, geared their research programs to be of service to local governments.

URBAN PROCESSES As Viewed by the Social Sciences
79 pages, SBN 87766-001-8, \$1.95, paper

William Gorham, President of the Urban Institute, moderates a National Academy of Sciences symposium organized by the Institute. The discussion focused on the economic, political, and social institutions which distribute wealth and power in American society, with emphasis on the impact of these institutions on the cities.

The discussants are Kenneth J. Arrow, Professor of Economics, Harvard University; James G. March, Dean of the School of Social Science, University of California-Irvine; James S. Coleman, Professor of Sociology, Johns Hopkins University; and Anthony Downs, Chief Executive Officer, Real Estate Research Corporation.

Major topics include the strengths and weaknesses of the market system, improvements necessary to give cities a better share of national political power, the social basis for breakdowns in both the economic and political systems, and the future of the American ghetto.



THE URBAN INSTITUTE

2100 M Street, N.W. Washington, D.C. 20037

The Urban Institute Board of Trustees

Arjay Miller, *Chairman*
Dean, Graduate School of Business
Stanford University
Stanford, Calif.

William Gorham
President, The Urban Institute
Washington, D. C.

William C. Friday
President, University of North
Carolina
Chapel Hill, N. C.

Eugene G. Fubini
Consultant
New Canaan, Conn.

John W. Gardner
Chairman, Urban Coalition
Washington, D. C.

Judge William H. Hastie
U. S. Court of Appeals
Philadelphia, Pa.

Edgar F. Kaiser
Chairman, Kaiser Industries
Corp.
Oakland, Calif.

Edward Hirsch Levi
President, University of
Chicago
Chicago, Ill.

Bayless A. Manning
Dean, School of Law
Stanford University
Stanford, Calif.

Stanley Marcus
President, Neiman-Marcus
Dallas, Texas

Robert S. McNamara
President, World Bank
Washington, D. C.

J. Irwin Miller
Chairman, Cummins Engine
Co., Inc.
Columbus, Ind.

Franklin D. Murphy
Chairman, Times Mirror Co.
Los Angeles, Calif.

Charles L. Schultz
Senior Fellow, Brookings
Institution
Washington, D. C.

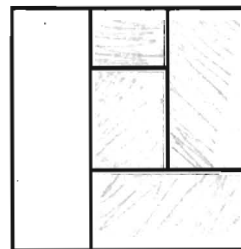
William W. Scranton
U. S. Ambassador
Scranton, Pa.

Leon H. Sullivan
Chairman, Opportunities
Industrialization Center
Philadelphia, Pa.

Cyrus R. Vance
Partner, Simpson, Thacher &
Bartlett
New York, N. Y.

James Vorenberg
Professor, School of Law
Harvard University
Cambridge, Mass.

Whitney M. Young, Jr.
Executive Director, National
Urban League
New York, N. Y.



THE URBAN INSTITUTE