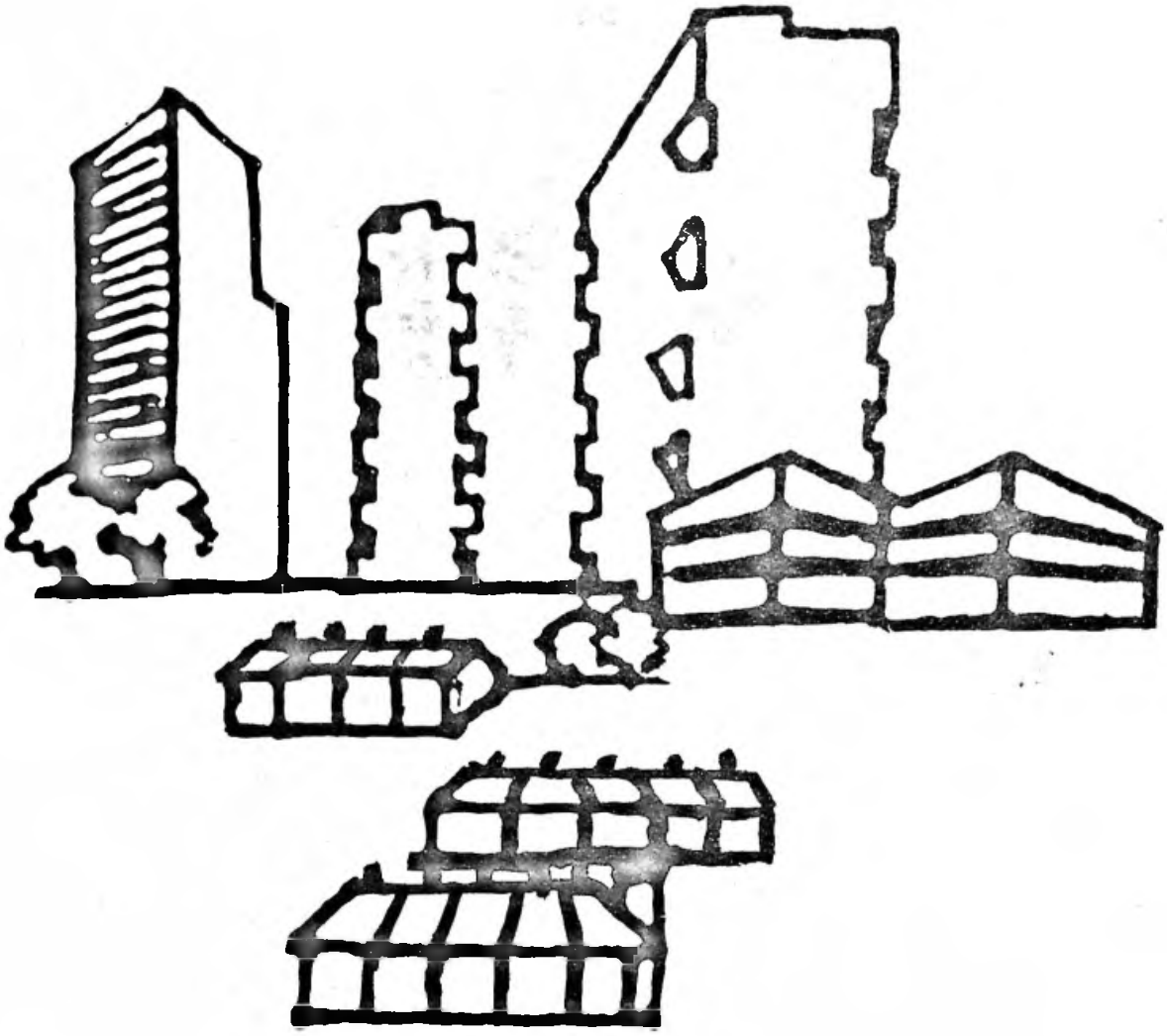
U.S. Department of Housing and Urban Development
Office of Policy Development and Research

The Costs of HUD Multifamily Housing Programs

Volume 1

A Comparison of the Development, Financing and Life Cycle Costs of Section 8, Public Housing, and Other Major HUD Programs



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A Comparison of the Development, Financing and Life Cycle Costs of Section 8, Public Housing, and Other Major HUD Programs

Prepared for:
U.S. Department of Housing and Urban Development
Office of Policy Development and Research
Washington, D.C. 20410

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The research and studies forming the basis for this report were conducted pursuant to a contract with the Department of Housing and Urban Development (HUD). The statements and conclusions contained herein are those of the contractor and do not necessarily reflect the views of the U.S. Government in general or HUD in particular. Neither the United States Government nor HUD makes any warranty, expressed or implied, or assumes responsibility for the accuracy or completeness of the information herein.

ACKNOWLEDGEMENTS

The research presented in this report was conducted pursuant to HUD Contract H-5252 for the Division of Housing Assistance, Office of Policy Development and Research, of the U.S. Department of Housing and Urban Development.

The Project Director was Ann Schnare, and the Deputy Project Director was Benaree Wiley. Ann Schnare and Carla Pedone were responsible for the analysis of Development Costs (Chapter 3, 4, and 5); William Moss conducted the analysis of subsidy costs (Chapter 7); and Kathleen Heintz analyzed program administration and design (Chapter 2 and 6). Benaree Wiley was responsible for all phases of project management and data acquisition. In addition to the authors of this report, numerous other USR&E staff contributed to this study, including Anthony Blackburn, Peter Eleftherakis, Eric Fanwick, Judy Sklare, Caroline Baldwin, Madeline Nash, Gail Fitzgerald, Roby Colodny, and Adele Baden. Two subconstractors--Coopers and Lybrand and the Granville Corporation--participated in on-site data collection efforts.

The authors of the report are indebted to the Government Technical Representative, who provided invaluable guidance throughout the course of the evaluation. We would like to thank the numerous reviewers inside and outside of HUD who provided comments on earlier drafts. However, the conclusions presented here represent findings of USR&E staff, and do not necessarily reflect the views of the U.S. Government or the Department of Housing and Urban Development.

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EXECUTIVE SUMMARY

This study examines the costs of developing multi-family housing under HUD programs. The principal program types included in the study are: Section 8, Public Housing, Section 236 Rent Supplement, and unsubsidized FHA.[1] In addition, several different financing and processing variants are included for Section 8 and public Housing, producing a total of 12 different program/financing types. These program variants are listed in Exhibit 1.

The study is based on certified cost and attribute data collected for over 800 multi-family housing projects developed between 1975 and 1979. About 11 percent of these projects involved substantial rehabilitation; the remainder were new construction. As a result, the study is able to compare the relative costs of new construction and substantial rehabilitation, as well as the costs of producing various kinds of subsidized and unsubsidized housing.

Overview and Objectives

The analysis of development cost was designed to address six major issues:

- What are the average costs of developing various types of subsidized and unsubsidized housing projects? In particular, how do such costs vary by financing mechanism, program type, and processing agency?
- How do the characteristics, location, and the length of the development period differ under the different program variants?

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[1]Section 221(d)4 and Section 221(d)3.

Exhibit 1

PROGRAM VARIANTS INCLUDED IN THE ANALYSES

Program/Financing Variant	New Construction	Substantial Rehabilitation
SECTION 8		
1. 202/8	X	
2. HUD-processed		
a. FHA insured	X	X
b. 11(b) insured	X	
3. SHFA-processed		
a. FHA insured	X	X
b. Uninsured	X	X
PUBLIC HOUSING		
1. Turnkey	X	
2. Conventional	X	
SECTION 236 RENT SUPPLEMENT	X	
UNSUBSIDIZED 221(d)4/(d)3	X	

- What is the impact of this variation on project development costs?

- Do certain program variants produce equal quality housing at consistently lower construction costs? That is, does cost effectiveness vary by program, financing mechanism, processing agent, or sponsor type?

- What are the direct and indirect costs associated with the ways in which the different program variants are financed?

- And, in the end, what are the annual life cycle costs to the government of the different housing programs?

In addressing these basic issues, the study should help to resolve many of the important policy questions related to the relative costs of building and financing subsidized and unsubsidized multi-family rental housing.

The study itself has three major components. It begins with an examination of average development costs under various programs, key financing mechanisms, and processing agencies. Standard analysis of variance is used to identify significant differences among the variants with respect to total costs and to each of several cost components. Throughout the analyses, nominal development costs have been adjusted to reflect "real" or "constant" dollars in order to control for variations in the costs of construction in different cities and over time. The descriptive analysis also examines differences in the type, location, and other characteristics of projects developed under the different program variants.

The second component of the analysis identifies the various factors that account for the observed differences in development costs both within and among programs. Using regression analysis to relate development costs to the characteristics of the project, the sponsor, and the program variant, the analysis compares the costs of producing an identical unit under the different program types and estimates the average project-related and "program-related" differentials for each. The programmatic differentials--calculated for total

development costs and each of their major components--reflect the relative efficiency of housing production under the different program variants.

The final part of the analysis takes the development costs of different housing programs and translates these into life cycle costs to the federal government. Subsidy costs include both direct subsidies, such as rental assistance payments or interest subsidies under Section 236, and indirect subsidies, including tax losses due to the use of tax exempt bonds, excess depreciation, and forgone property taxes. Together the three study components provide a rather complete picture of the costs and relative efficiency of producing housing under the various program types. The following sections summarize our major findings, beginning with a comparison of the average costs and characteristics of the housing developed under different program variants.

Average Per Unit Development Costs

An examination of the average costs of the projects in our sample revealed several major patterns reflecting systematic differences between the twelve program/financing variants. Beginning with "bricks and mortar" or improvement[1] costs, the per unit variation among most new construction programs is fairly modest. Costs range from $22,000 for unsubsidized units to about $25,000 for Section 236 and uninsured units processed by State Housing Finance Agencies (SHFAs). This range suggests a maximum difference of about 12 percent between unsubsidized FHA and most kinds of subsidized new construction. By contrast, Section 202/8 and Public Housing

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[1]As defined in this study, improvement costs equal construction costs (including site improvements, dwelling construction and equipment, and non dwelling construction) plus architectural and engineering fees. Hard costs are improvements plus land and offsite. The remaining soft costs of development include construction period carrying charges, program financing and filing fees, builder/sponsor profit, legal and organizational costs, and other miscellaneous development costs.

units are substantially more expensive than unsubsidized units. These differences range from 29 percent for Section 202/8 to around 60 percent for both Public Housing variants.

The differences among the new construction programs persist when other hard development costs--land and off-site costs--are added to improvements (see Exhibit 2). In addition, the hard costs of FHA insured substantial rehabilitation are shown to be virtually identical to the costs of newly constructed unsubsidized units. However, the hard costs of SHFA non-insured substantial rehabilitation exceed the costs of such units by 34 percent.

Finally, from the perspective of total development costs, the per unit differences become less pronounced. This is due to the tendency for programs with relatively high hard costs to have comparatively low soft development costs. In all, about one-third of the program variants had average costs that were not significantly different from the cost of unsubsidized FHA. These include: 11(b) FHA; uninsured SHFA new construction; and FHA Substantial Rehabilitation. The cost of HUD-processed Section 8 new construction was about 4 percent higher than unsubsidized FHA, while Section 236 and Section 202/8 had differentials of 9 and 12 percent, respectively. Again, the largest differentials are observed for Public Housing, whose total development costs are some 37 percent higher than the costs of unsubsidized FHA.

Per Square Foot Costs

Comparing the patterns described above for per unit costs with patterns in costs per square foot of space illustrates the existence of considerable variation in the types of projects produced under the different program/financing variants. For example, when expressed on a square foot basis, the total development costs of unsubsidized new construction ($32/foot) become substantially lower than those for all types of subsidized new construction (see Exhibit 3). Differences range from 13 percent for Section 236 to 72 percent for Turnkey Public Housing. The relative ranking of the various subsidized programs also changes to some extent. In particular,

Exhibit 2

Per Unit Development Costs: 1980 Dollars Adjusted
for Regional Differences in Costs
(weighted)

	Hard Costs	Soft Costs	Total Development Costs
SECTION 8			
NEW CONSTRUCTION			
202/8	$29,803	$3,734	$33,537
HUD FHA	24,969	6,279	31,248
11(b) Insured	25,596	6,109	31,705
SHFA FHA	25,796	6,082	31,878
SHFA Uninsured	26,634	4,184	30,818
SUBSTANTIAL REHAB			
HUD FHA	24,454	6,914	31,368
SHFA FHA	24,318	6,664	30,982
SHFA Uninsured	31,705	5,777	37,482
PUBLIC HOUSING			
Turnkey	38,351	2,536	40,887
Conventional	38,472	2,979	41,451
236 RENT SUPPLEMENT	26,212	6,262	32,474
UNSUBSIDIZED FHA	23,721	6,207	29,928

Exhibit 3

Development Costs Per Square Foot of Gross Space: 1980
Dollars Adjusted for Regional Differences in Costs
(weighted)

	Hard Costs	Soft Costs	Total Development Costs
SECTION 8			
NEW CONSTRUCTION			
202/8	$38.98	$ 4.91	$43.89
HUD FHA	30.95	7.79	38.74
11(b) Insured	30.20	7.28	37.48
SHFA FHA	33.01	7.71	40.72
SHFA Uninsured	31.86	5.34	37.20
SUBSTANTIAL REHAB			
HUD FHA	26.58	7.47	34.05
SHFA FHA	24.98	6.88	31.86
SHFA Uninsured	29.13	5.28	34.41
PUBLIC HOUSING			
Turnkey	52.17	2.60	54.77
Conventional	46.33	3.47	49.80
236 RENT SUPPLEMENT	29.09	6.92	36.01
UNSUBSIDIZED FHA	25.28	6.59	31.87

Section 236 units become somewhat cheaper than HUD- or SHFA-processed Section 8, and Section 202/8 units become even more expensive.

Among the Section 8 substantial rehabilitation programs, per square foot costs for state uninsured units are virtually identical to those for HUD-FHA units, with costs for all three rehab variants falling below those of new construction Section 8. Finally, Turnkey Public Housing is 10 percent more expensive than Conventional Public Housing when expressed on a per-square foot basis.

Project Characteristics

The changes in the relative ranking of program costs when expressed on a square foot, as opposed to unit basis, are to some extent explained by differences in the average size of units produced under the various program variants. Average unit sizes were found to be systematically larger in unsubsidized projects (821 square feet) when compared to subsidized projects. The latter ranged from 539 square feet for Section 202/8 units to 787 square feet for Section 236 units. Among the subsidized programs, units developed under Section 236 and Public Housing (particularly Conventional Public Housing) tended to be larger than those developed under Section 8. Within Section 8, by far the largest units on average were found in SHFA uninsured substantial rehabilitation, while not surprisingly, Section 202/8 units tended to be smallest.

Analysis of project characteristics other than size revealed further systematic differences among programs. The following paragraphs compare the projects developed under the major program types with respect to structure type, location, amenities, and tenant type (See Exhibit 4). Information is also provided concerning the experience of the developer/sponsor.

Unsubsidized FHA:

Unsubsidized projects provide substantially more amenities than subsidized projects. However, they tend to be less expensive structure types, primarily low-rise walk-up apartment buildings,

Exhibit 4

SELECTED STRUCTURAL CHARACTERISTICS OF PROJECTS[1,2]
(Weighted)

TYPE OF CHARACTERISTIC	UNSUBSIDIZED	SUBSIDIZED										
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING	
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION	
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional
AVERAGE UNIT SIZE[a] (Square Feet)	821	787	539	664	679	653	676	663	606	745	697	755
PROJECT AMENITIES												
Air Conditioning[a]	89.3 %	54.3 %	66.0 %	75.4 %	50.3 %	88.3 %	54.4 %	53.5 %	35.0 %	75.8 %	51.8 %	20.9 %
Dish Washers	93.9	2.7	6.5	10.2	22.2	7.4	9.1	9.4	10.0	43.6	3.0	0.0
Carpets[a]	98.0	47.9	91.1	84.4	67.8	73.8	71.7	51.0	30.0	77.4	37.5	14.0
Recreation Rooms	45.0	30.2	44.1	61.1	79.3	57.3	63.0	29.1	55.0	43.3	83.1	62.4
Swimming Pool	64.9	7.9	0.0	4.3	8.0	4.6	3.2	4.7	0.0	0.0	0.0	0.0
LOTSIZE PER UNIT[a] (Square Feet)	2,808	2,771	2,562	2,871	2,625	3,090	2,695	946	1,333	1,244	3,467	6,992
STRUCTURE TYPE												
Semi-attached or Detached[a]	5.8 %	3.7 %	8.0 %	9.5 %	3.5 %	17.3 %	10.5 %	1.8 %	0.0 %	0.0 %	22.0 %	39.4 %
Row[b]	8.5	3.7	6.8	11.2	18.2	13.7	20.1	3.8	0.0	0.0	13.7	17.5
Walk-Up[a]	64.7	13.4	5.4	17.1	19.4	18.0	7.9	16.2	0.0	15.5	1.3	5.5
Elevator[a]	7.5	7.0	72.8	43.0	35.6	26.8	38.7	64.0	75.0	35.5	35.9	20.5
Mixed	13.4	72.1	7.0	19.3	23.3	24.2	22.8	14.3	25.0	49.0	27.1	17.2
EXTERIOR FINISH												
Durable[a]	12.4 %	28.4 %	38.7 %	37.6 %	34.7 %	42.6 %	35.1 %	77.4 %	76.9 %	82.7 %	39.6 %	43.7 %
Mixed Durable[a]	30.8	35.8	28.6	32.2	36.2	38.2	17.2	11.0	15.4	17.3	18.3	43.7
PERCENT ELDERLY[a]	1.2 %	12.2 %	96.7 %	60.2 %	63.3 %	52.8 %	58.0 %	40.7 %	45.0 %	38.4 %	36.7 %	32.2 %
Sample Size[3]	132	77	58	132	19	78	132	54	13	19	41	40

[1]The level of significance at which F tests or Chi Square tests reject the hypothesis of equal means or distributions across program types is indicated as follows:

a = .001; b = .01; c = .05; d = .1.

[2]eta[2] indicates the proportion of variance explained by program type.

[3]Sample Sizes refer to the number of observations available on project amenities.

frequently built out of less-durable materials. They also tend to be located relatively frequently in the suburbs of midsized SMSAs and hardly ever in declining or deteriorated neighborhoods.

Relative to developers of subsidized new projects (except Public Housing), the developers of unsubsidized projects do not syndicate as frequently and tend to have substantially less experience as housing producers. Experience is measured in terms of number of projects and number of units developed.

Section 236:

Except for their large unit size, Section 236 projects appear to be of somewhat lower quality than Section 8 projects. They tend to have certain amenities (drapes, carpets, recreation rooms and playgrounds) less frequently than Section 8 projects, and the use of less durable building materials is also somewhat greater than among Section 8. Like unsubsidized projects, they are rarely designed for the elderly.

The majority of Section 236 projects are located in central cities of the larger SMSAs, where they tend to be found more frequently in deteriorated neighborhoods than Section 8 projects. Section 236 developers were found to have more development experience than sponsors in any other program type.

Section 8 New Construction:

Among the various types of Section 8 new construction projects, no substantial variation exists in the amenities provided. The composition of structure types and building materials is also fairly similar, with the exception of the preponderance of multi-story elevator buildings among Section 202/8 projects. With respect to location, State and 11(b) financed projects tended to be geared somewhat more toward non metropolitan areas, with over half of their projects located outside of SMSAs. The SHFA-financed projects were found to be particularly concentrated in very small places and were located perhaps a bit more frequently in blighted areas than other Section 8 variants. SHFA-financed projects also tend to have

non-profit developers more frequently than other types of Section 8, a tendency which at least partly explains the relatively low experience levels of developers participating in the SHFA non-insured program.

Section 8 Substantial Rehabilitation:

Projects developed under the Section 8 substantial rehabilitation programs were found to be somewhat less luxurious in terms of amenities than new Section 8 projects. However, the SHFA noninsured variety appeared more similar to new projects in this respect.

Housing produced under substantial rehabilitation was found to be more dense than new construction, as evidenced by small lot sizes per unit and larger proportions of high rise elevator buildings. Most rehabilitation tends to be in central cities of SMSAs, with more than one quarter of the projects in deteriorated or blighted areas. Developers of substantial rehabilitation projects tend to be smaller than developers of new subsidized housing and have less experience. They are also more frequently non-profits.

Public Housing:

Public Housing projects are generally the most austere program type in terms of unit amenities. However, Turnkey projects do tend to provide project-wide amenities at levels similar to Section 8. Building types include substantial proportions of low-density semi-attached or detached structures, particularly in Conventional projects.

The great majority (almost 90 percent) of Conventional Public Housing projects are at least partially constructed of durable materials, compared to less than two-thirds of the Turnkey projects. In addition, while Turnkey projects resemble Section 8 in terms of location, more than half of Conventional projects are located outside SMSAs and are particularly concentrated in small places.

Explaining Variations in Unit Development Costs

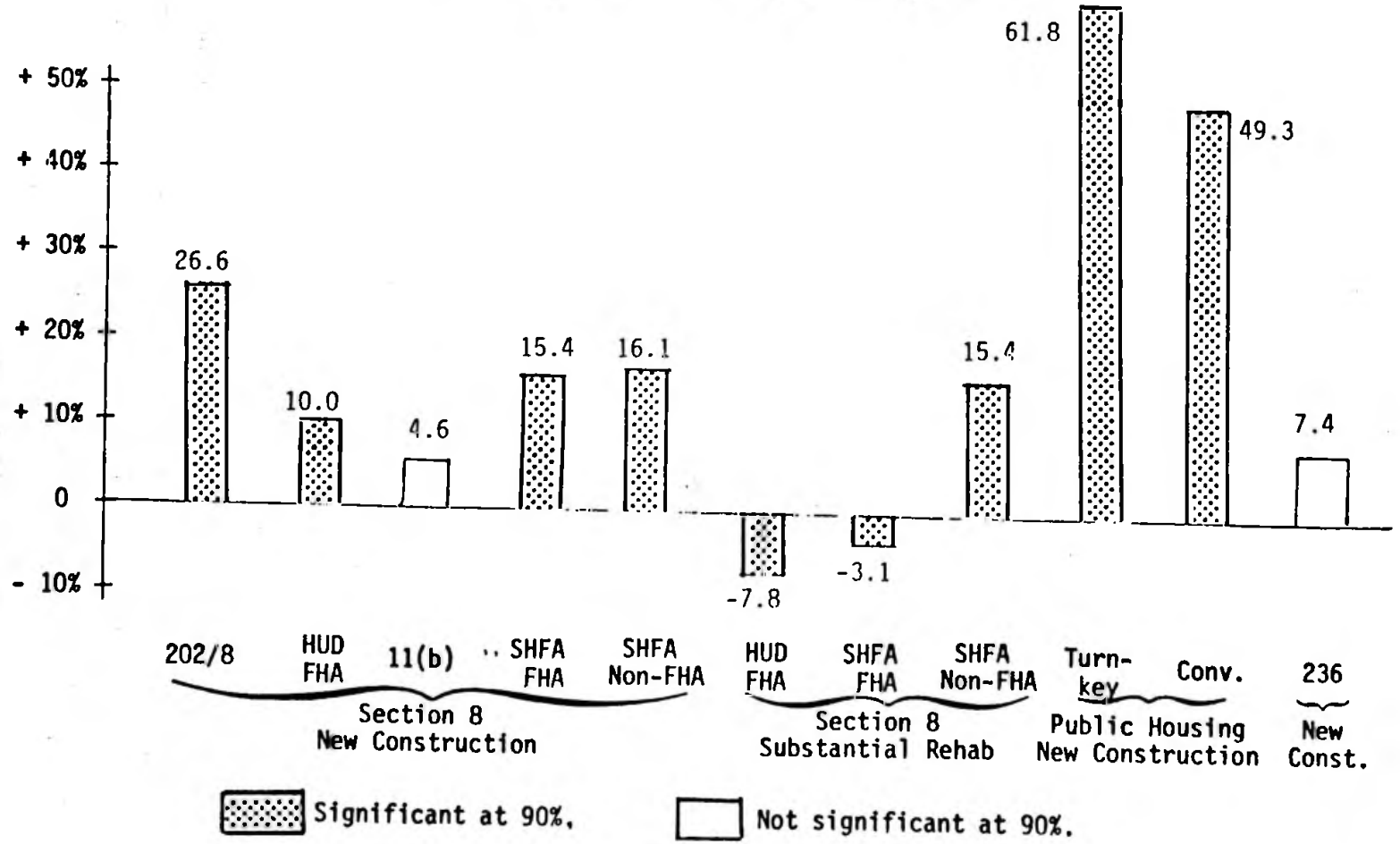
The differences in project characteristics described above will have an obvious impact on development costs. Thus, the second part of the analysis attempted to decompose the observed differences in per unit development costs into two major components: differentials that were related to the characteristics of the projects, and differentials that were related to the program/financing type. In particular, we asked the following question: how much of the observed variation in the average unit costs of unsubsidized and subsidized housing can be attributed to differences in the characteristics or location of the units, and how much is simply due to the relative efficiency (or inefficiency) of the different program variants?

To answer this question, we first used multiple regression analysis to relate unit development costs to a series of variables describing the project, its location, and its sponsor, as well as the basic program/financing type. The estimated coefficients of the various program dummies revealed the relative costs of producing an identical unit under the different program types. Exhibit 5 displays the estimated percentage hard cost differentials implied by the regression for each of the twelve program financing variants. As the figure illustrates, only two of the program variants (Section 11(b) and Section 236 Rent Supplement) were insignificant; the remaining program types showed substantial cost differentials when compared to unsubsidized projects which are similar in terms of size, structure type, composition of units, and sponsor type.

Within Section 8, the lowest costs were found for HUD-processed substantial rehabilitation, reflecting the relative efficiency of most types of renovation. Section 8 new construction programs, on the other hand, showed significant cost markups ranging from 10 percent for HUD-FHA to nearly 27 percent for Section 202/8. However, all types of Section 8 proved to be relatively inexpensive when compared to Public Housing. In general, the hard costs of Public Housing exceed those of otherwise similar unsubsidized developments by approximately 55 percent.

Exhibit 5

ESTIMATED PERCENT DIFFERENTIALS IN PER UNIT OFFSITE, AND IMPROVEMENT COSTS
New Construction and Substantial Rehabilitation



Using the hard cost differentials presented above, along with other information on actual per unit costs and project characteristics, the next step was to decompose average per unit cost differences into their project-related and program-related elements. Exhibit 6 shows this breakdown with respect to total development costs. Average total cost differentials are presented in the lowermost histogram. For each program type, the amount is divided into costs attributable to differences in the characteristics of the project (uppermost histogram) and costs related to the efficiency of the program/financing mechanisms (middle histogram).

In general, most of the observed variation average development costs reflects program-related markups, as opposed to differences in the types of projects built. Although the underlying "value" of the units did vary by program type, such differences were typically small in comparison to programmatic differences in the costs of constructing an identical unit. It is also important to note that the project-related differentials typically reflected fundamental differences in project design or structure type. As such, there is no evidence to suggest that observed differences in average program costs result from variations in the level of project or unit amenities. Despite these similarities, however, our analysis of project- and program-related markups (and discounts) did uncover some distinctly different patterns for the various program/financing types.

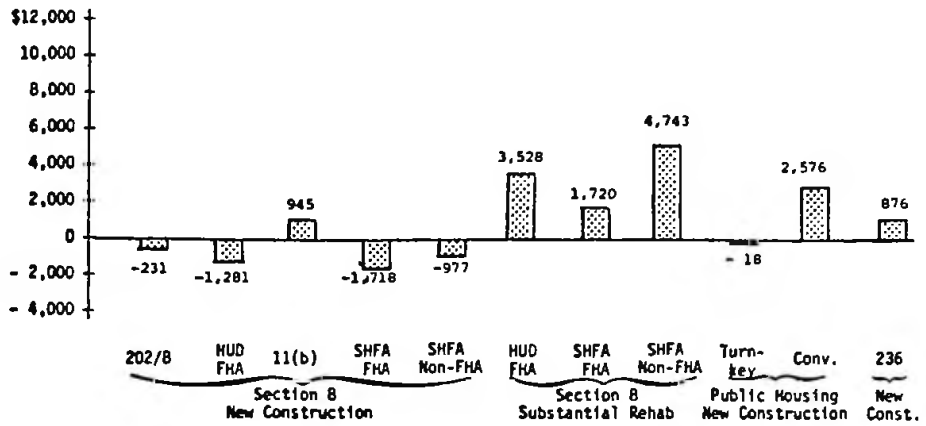
Section 8 New Construction:

Compared to unsubsidized FHA, three variants of the Section 8 New Construction program--HUD/FHA, SHFA/FHA and SHFA-uninsured--tended to produce less expensive types of projects than those developed in the unsubsidized market. However, the project related savings were typically fairly small and more than offset by program-related markups in hard development costs. Specifically:

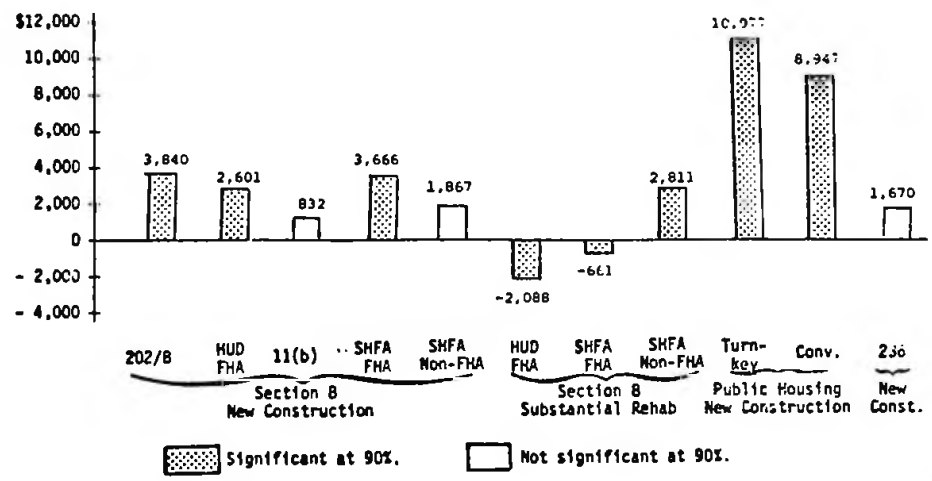
Exhibit 6

SOURCE OF DIFFERENCE IN TOTAL DEVELOPMENT COSTS

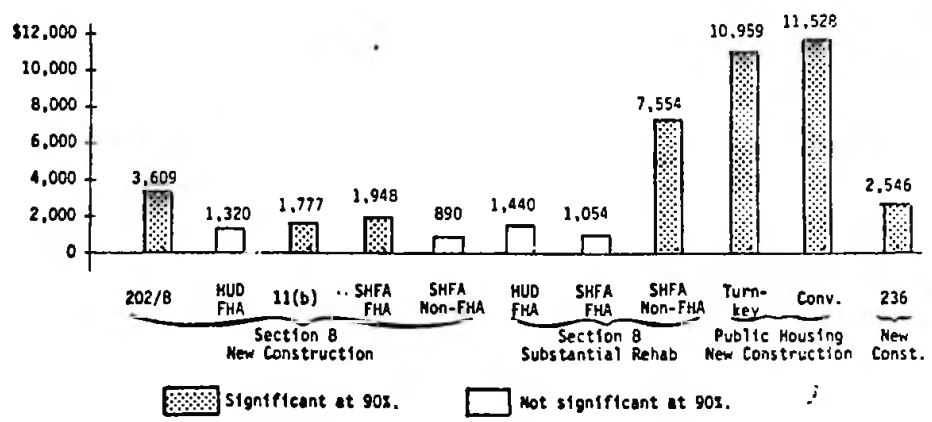
A: AVERAGE PROJECT RELATED DIFFERENTIALS ($)



B: AVERAGE PROGRAM-RELATED DIFFERENTIALS ($)



C: AVERAGE TOTAL COST DIFFERENTIAL ($)



- For HUD/FHA Section 8, project-related savings were offset by a programmatic markup of 10 percent for hard costs. In the end, their average development costs were 4.4 percent higher than those for unsubsidized FHA.

- SHFA/FHA Section 8 projects also showed large project-related savings. However, a programmatic markup in hard costs of 15.4 percent led to higher average development costs than unsubsidized FHA.

- For SHFA uninsured Section 8, high construction cost markups were offset both by savings related to the project itself and by significant soft cost savings. As a result, total average costs were roughly comparable to those of unsubsidized FHA.

In contrast, Section 202/8 appeared to have produced units whose underlying value was roughly comparable to unsubsidized FHA and, thus, marginally more expensive than the other Section 8 new construction variants. In the absence of project-related savings, the relatively high cost of Section 202/8 is largely explained by program-related markups in hard development costs, which averaged about 24 percent. Although large savings in the soft components of development costs helped to reduce the total development costs of Section 202/8 projects, their average total costs were still about 12 percent higher than the average cost of unsubsidized FHA.

Finally, 11(b) projects appeared to be fairly similar to unsubsidized housing, both in terms of costs and in the kinds of units built. However, this latter finding may simply reflect their relatively small sample size (= 19).

Section 8 Substantial Rehabilitation:

Unlike most types of Section 8 New Construction, Section 8 Substantial Rehabilitation typically produced more expensive types of units than unsubsidized FHA, with project-related markups ranging from about 6 to 17 percent. However, FHA-sponsored projects typically produced these units at a significantly lower cost than would have occurred had the projects been built under unsubsidized FHA. As a result, their total development costs were almost identical to the costs of newly constructed unsubsidized units.

Among the three rehab types, the program-related savings observed for FHA-sponsored projects undoubtedly reflect the relative efficiency of most renovation vis-a-vis new construction. However, the preponderance of gut rehabilitation for uninsured SHFA projects eliminated all such savings, and resulted in average development costs that were about 25 percent higher than the average costs of unsubsidized FHA. Since the sample of such projects is relatively small, this pattern may not characterize uninsured SHFA rehabilitation in general. However, it does serve to illustrate the general inefficiency of gut rehabilitation as a mechanism for producing subsidized housing.

Public Housing:

Conventional Public Housing has produced more expensive types of units than those developed in the unsubsidized market, primarily due to its concentration of large units and relatively expensive structure types. In general, these project-related differences added about 9 percent to the costs of Conventional Public Housing vis-a-vis unsubsidized FHA. While such markups are large in comparison to the other new construction programs, they are small when compared to the program-related markups for this program variant. Although the soft costs in Public Housing are relatively low, the large differentials in hard development costs produced program-related markups in total costs that averaged about 31 percent. Such markups were twice as high as those observed under Section 202/8, and over three times as high as the markup for HUD-processed Section 8. Combined, the project- and program-related differentials for Conventional Public Housing produced average development costs that were almost 40 percent higher than those observed for unsubsidized FHA.

In contrast, the kinds of units that were developed under the Turnkey Program were less expensive than those produced under Conventional Public Housing, and fairly similar to those developed under unsubsidized FHA. However, the absence of project-related markups for Turnkey units did not result in lower costs. Rather,

the extremely large program-related markup in hard development costs (62 percent) produced average total costs that were roughly comparable to Conventional Public Housing, and about 37 percent higher than the average costs of unsubsidized FHA.

Section 236:

Finally, the Section 236 Rent Supplement program appears to have produced marginally more expensive kinds of units than those developed under unsubsidized FHA. Although there is some evidence of a positive program markup, it is statistically insignificant. This finding implies that the higher costs of Section 236 projects vis-a-vis unsubsidized FHA are primarily related to characteristics of the units developed.

Program Direct and Indirect Subsidies

While the programmatic markups described above indicate significant--and potentially controllable--inefficiencies within the development phase of certain program types, other features of the different programs--such as their use of tax-exempt financing or more favorable depreciation schedules--have a dramatic impact on their ultimate cost to the government. Thus, the third part of the analysis compares the various programs from this life cycle perspective. In particular, we examine the nature and the extent of various kinds of direct and indirect subsidies received by the different programs. Two different time frames are used. The first examines estimated program life-cycle costs and subsidy levels using the structure of interest rates and tax laws that prevailed in 1979, the period in which the majority of the projects were developed. The second examines program subsidies in light of recent revisions to the federal tax code and expected future trends in interest rates.

The analysis begins by assuming identical "bricks and mortar" and operating costs for the different program variants. This equal cost assumption enables us to isolate the impact of the program/financing mechanism on the public sector's costs. However, it ignores significant variations in the underlying efficiency of

different programs. To account for these, the next part of the analysis drops the equal cost assumption, and permits improvement costs to reflect the estimated program-related differences in the costs of constructing an identical unit. The final part of the analysis uses the actual bricks and mortar costs that are observed in the different programs. These costs reflect differences in the types of units built, as well as differences in the underlying efficiency of the different programs.

When the type of housing unit and hard costs are held constant, subsidy costs for the various programs are as follows:

- Section 202/8 and Public Housing receive the lowest overall subsidies. Direct subsidies are low primarily because of low rent subsidies. This occurs because these programs pay no return on equity, no mortgage insurance premiums, and lower property taxes than other programs. Indirect subsidies are low because they take no depreciation deductions, no deductions for construction period interest and taxes, and, for Section 202/8, no benefits from the use of tax exempt bonds.

- The highest subsidies are received by state processed substantial rehabilitation projects using a five year writeoff for a large proportion of improvement costs (Section 167(k) depreciation).

- The subsidies received by other programs range from about $4,000 to $4,900 per year. By contrast, Section 202/8 receives about $3,100 per year; Public Housing about $3,600; and state-processed substantial rehabilitation using 167(k), over $5,000 per year. The latter receives about $650 more per year in indirect subsidies because of the use of 167(k).

When actual bricks and mortar costs are used, the relative ranking of the programs changes substantially. These results are shown in Exhibit 7 and summarized below:

- The highest subsidies are still received by state uninsured substantial rehabilitation projects. This is due to both 167(k) depreciation deductions, and foregone taxes due to the use of tax exempt bonds.

- However, Public housing now receives the second highest level of subsidies. This is due to the marked increase in development costs compared to the scenario in which hard costs are the same for all projects. This affects direct

Exhibit 7

ANNUAL* TOTAL PROJECT COSTS AND SUBSIDIES. 1979.

Program	PROJECT COSTS			Annual Subsidy Costs	Subsidies as a Percent of Total Project Costs
	Annual Development Costs	Annual Operating Costs	Total Annual Costs		
Section 8					
New Construction					
202	$ 3,788	$ 3,612	$ 7,400	$ 3,907	52.8%
HUD FHA, GNMA Tandem	3,560	3,935	7,495	4,668	62.2
11(b) Insured	3,581	3,942	7,523	5,384	71.6
SHFA FHA	3,636	3,960	7,596	5,525	72.7
SHFA Uninsured	3,587	3,832	7,419	5,520	74.4
Substantial Rehabilitation[1]					
HUD FHA, GNMA Tandem	3,532	3,895	7,427	5,192	69.9
SHFA FHA	3,406	3,883	7,289	5,869	80.5
SHFA Uninsured	4,252	4,062	8,314	7,193	86.5
Public Housing					
Turnkey	5,098	3,844	8,942	6,027	67.4
Conventional	4,773	4,006	8,779	5,857	66.7
236 Rent Supplement	3,819	4,006	7,825	4,570	58.4
Unsubsidized 221(d)4	3,475	3,868	7,343	68	0.9

* Annual amounts equal the constant annual payment from a 20-year annuity valued at the present value of subsidies and paying an interest rate equal to the discount rate, 11 percent. See Appendix J.

subsidies through higher rent subsidies, since higher development costs increase annual loan payments. Indirect subsidies are affected through local taxes foregone and income taxes foregone when tax exempt bonds are sold to the public.

- The lowest subsidies continue to be received by Section 202/8 in spite of its high development costs.

Finally, when we perform the analysis using expected future interest rates and the 1981 tax law, two primary results emerge. First, the higher interest rates and the tax changes have only a small effect on development costs. However, they have a large effect on the subsidy levels received.

Indirect subsidies due to excess depreciation increase markedly because of the shortening of the depreciation period to 15 years. The exception is rehabilitation using 167(k); the new tax law changes foregone taxes very little, and the incremental benefit to sponsors of using 167(k) is about 40 percent of what it was before the tax law change. Rent subsidies in this future scenario also increase due to higher interest rates and consequently higher loan payments. Direct interest rate subsidies increase for Section 236 because of the increased absolute difference between the subsidized mortgage interest rate and the U.S. long-term borrowing rate. Finally, the GNMA tandem subsidy increases significantly.

In connection with these results, it may be noted that they are sensitive to certain variations in the assumptions. For example, the level of indirect subsidies due to the use of tax exempt bonds is very sensitive to our assumed bond holder tax rate. Using a 15 percent tax rate instead of 38 percent decreases these subsidies by three fifths. While state-uninsured substantial rehabilitation projects continue to have the highest subsidies, the change in tax rate results in subsidy costs for Section 11(b) and SHFA-FHA projects that are lower than those of all programs except Section 202/8.

It is also interesting to note that while subsidies for GNMA Tandem are very sensitive to market rates of return (and therefore the discount at which GNMA sells the mortgages), they are not sensitive to changes in the maximum mortgage interest rate permitted under the program. This is because the higher interest rate will produce a lower discount subsidy which almost exactly offsets the increased rental subsidy.

Conclusion

Several major conclusions emerge from the analysis described above. One of the most important of these relates to the relative costs of constructing an identical unit under the different program/financing types. In general, the hard costs of newly constructed subsidized units exceed the costs of otherwise similar housing developed under unsubsidized FHA. The differences are fairly small for most of the program variants, ranging from about 10 percent for HUD-processed Section 8 to about 16 percent for uninsured SHFA. However, for Section 202/8 and Public Housing, the differences are more dramatic, with estimated program markups of 27 and 55 percent, respectively.

Given these high programmatic markups, it became important to review the factors thought to account for higher costs, especially for Public Housing. While the analysis controlled for key factors related to the physical characteristics of the projects, several possible sources of the observed markups were explored. These include: (1) differences due to design or construction quality; (2) unusually high cost budget items such as land, off site, and site improvements; (3) differences in developer incentives; (4) differences in cost control mechanisms; and (5) other factors related to processing, including the experience of the processing agency.

Based on the available evidence, it is unlikely that design or construction quality differences account for the large program markups associated with Public Housing. While Public Housing projects do reflect somewhat higher quality standards, the impact on

costs to appear to be relatively minor. Moreover, assuming that cost differences do reflect real differences in quality, these investments would be difficult to justify either in operating cost savings or to meet the needs of different tenant types.

Although quality differences were probably slight for most Public Housing projects, higher land and site development costs appear to be an important factor in increasing Public Housing costs. The causes of these markups were difficult to pinpoint, but overall indicated a need for more careful control in this area. In addition, it appears that the large number of uncontrolled budget categories for Public Housing permits a greater proportion of Public Housing costs to fall into non-dwelling accounts. Finally, other programmatic differences including the incentives of the builder/developers and the experience of the processing agency appear to be important factors with respect to program costs, both for Public Housing and for the Section 202/8 program.

It is important to recognize that the study results -- both with respect to development cost markups and to total subsidy costs -- do not suggest any conclusions as to which programs should be maintained or dropped. The study focuses on program costs exclusively, and does not consider program benefits either with respect to the tenants served or to community development impacts that may be associated with the construction programs. Moreover, the life cycle cost estimates are extremely sensitive to the assumptions used.

What the study does show, however, is that high markups in development costs can dramatically alter the relative attractiveness of the programs when viewed from a life cycle perspective. For example, Public Housing subsidies are found to be among the lowest when equal bricks and mortar costs are assumed. When actual costs are used, however, Public Housing becomes the second most expensive program in terms of subsidy costs. This suggests that efforts to reduce development costs for this program type could result in enhanced long term savings to the government. The same is true, although to a lesser extent, for Section 202/8, which shows relatively high hard cost markups despite its low life cycle costs.

Chapter 1

INTRODUCTION

Since the inception of the public housing program, the apparently high costs of developing subsidized rental housing for low- and moderate-income households has generated some concern. In recent years, this has led to numerous efforts to compare the costs of various kinds of multi-family production programs, as well as to identify new areas for cost control and reduction. Given current initiatives to affect substantial savings in federal expenditures, the need to identify efficient ways of delivering housing services is even greater than before.

This study continues past efforts to examine the relative costs of different housing production programs. However, it differs from previous analyses in one important respect. By using data from a representative sample of over 800 projects, this is the first systematic attempt to determine the actual costs of project development under a variety of program types. Such data enable us to refine earlier estimates of relative program costs, as well as to examine the various factors that account for differences in development costs among alternative program and financing types.

1.1 Overview and Objectives

The study has been designed to address six major issues:

- What are the average costs of developing various types of subsidized and unsubsidized housing projects? In particular, how do such costs vary by financing mechanism, program type, and processing agency?
- How do the characteristics, location, and the length of the development period differ under the different program variants?
- What is the impact of this variation on project development costs?

- Do certain program variants produce equal quality housing at consistently lower construction costs? That is, does cost effectiveness vary by program, financing mechanism, processing agent, or sponsor type?

- What are the direct and indirect costs associated with the ways in which the different program variants are financed?

- And, in the end, what are the actual costs to the federal government of the different housing programs?

In addressing these basic issues, the analysis should help to resolve many of the important policy questions related to the relative costs of building and financing subsidized and unsubsidized multifamily rental housing.

The study itself has three major components. It begins with an examination of average development costs under various programs, financing mechanisms, and processing agencies. Standard analysis of variance is employed to identify significant differences among the variants with respect to total costs and to each of several cost components. Throughout the analyses, nominal development costs have been adjusted to reflect "real" or "constant" dollars in order to control for variations in the price of construction inputs across cities and over time. This descriptive analysis also examines differences in the type and location of projects developed under the different program variants.

The second component of the analysis attempts to identify the various factors that account for the observed differences in development costs both within and among programs. The study focuses on the major components of development costs, including land, improvements, and carrying charges; it also examines differences that are associated with total development costs. It begins with a regression analysis that relates development costs to the characteristics of the project, the sponsor, and the program variant. It then decomposes observed differences in development costs into two major components: differentials that are related to the characteristics of the projects built, and differentials that are related to program efficiency.

The third part of the analysis examines the direct and indirect

costs that are associated with the various forms of project financing. The direct costs of financing include all payments that are necessary to support the mortgage, as well as any associated monthly insurance or financing fees. The indirect costs include any revenue losses that might arise from interest rate subsidies, as well as any tax revenues foregone due to the issuance of tax exempt bonds or to the favorable treatment of depreciation and construction expenses. By examining such costs in relationship to operating expenditures and the tenant's ability to pay, the analysis is able to translate observed differences in project development costs into differences in the actual cost that is borne by the public sector.

1.2 Relevance to Public Policy

With recent budget cuts, and with expected future reductions in the level of funding for assisted housing, the need to channel limited resources into the most efficient subsidy vehicles is greater than ever before. The results of our analysis should help to foster this objective in several important ways. To begin with, the study provides more accurate estimates of the actual costs of supporting the various kinds of subsidized housing that exist today. Past research has typically assumed that the "bricks and mortar" costs of constructing an identical unit is the same in every program.[1] While this "equal-cost" assumption serves to highlight differences that are associated with financing costs, it ignores significant variations in the underlying efficiency of different programs. By substituting actual development costs for hypothetical figures, the current study produces more accurate comparisons and permits us to make better estimates of the actual costs of the various production programs.

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[1]For example, a recent GAO study recommended the increased use of public housing in lieu of Section 8 based on an analysis that assumed equal improvements costs of $22,000 per unit. Government Accounting Office, Evaluation of Alternatives for Financing Low and Moderate Income Rental Housing. PAD-80-13. September, 1980.

In addition, the study can be used to identify those delivery mechanisms which are most efficient producers of low- and moderate-income housing. To the extent that HUD -- or local governments -- continue to support any form of housing production, it will be important to weigh the relative costs and efficiency of alternative strategies. This study can help to identify needed modifications to existing approaches, or can serve as the basis for designing new production strategies which combine the more desirable features of the current programs.

1.3 Study Design

In designing this study, HUD faced several constraints with respect to the cost and availability of suitable data. One of the major limitations stemmed from a desire to base the analysis on certified development costs.[2] As a result, conventionally financed Section 8 projects had to be excluded from the study, since until recently such projects were not required to submit information regarding costs. Conventionally financed unsubsidized projects were also excluded, since "private" developers are neither required nor inclined to provide detailed information on the cost of their developments. The latter exclusion prevents us from addressing the recurrent charge that government assisted housing is more costly to build than housing constructed by the private sector.

Another constraint embodied in the analysis design involved the reliance on standard program processing forms to provide most of the requisite data. This restriction was primarily made in the interest of costs. Since the analysis required information on a relatively large number of projects, the cost of collecting data for a given development had to be fairly low. As a result, we did not attempt to conduct on-site inspections of the sample projects, although such inspections might have permitted more subtle comparisons of project design or quality than available data allow. Instead, we based the

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[2]All FHA projects as well as Public Housing and state financed projects must certify the actual costs of development at project completion.

bulk of our statistical analysis on data that were either available from agency files or could be obtained from a telephone survey of PHAs and project developers.

Table 1-1 presents the different program variants that appear in our analysis. As is evident from the chart, the sample encompasses four major multi-family housing production programs, including: (1) Section 8; (2) traditional Public Housing; (3) 236 Rent Supplement; and (4) unsubsidized FHA. The last program variant was included in the analysis to serve as a standard of comparison for the costs of subsidized and unsubsidized housing. Although unsubsidized FHA units are subject to many of the same regulations and requirements as the other program variants -- for example, Davis Bacon and MPS -- such comparisons will enable us to identify the impact of other factors associated with the production of subsidized housing.

We have also identified several key financing and processing variants for Section 8 and Public Housing, producing a total of 12 different program/financing types. The sample for Public Housing includes both Turnkey and Conventional units; while the sample for Section 8 includes Section 202/8 and a mix of SHFA- and HUD-processed units. Most of the programs considered are restricted to new construction. However, three of the Section 8 variants involve substantial rehabilitation. These latter program types were included in the analysis to allow for comparisons of the relative costs of renovation vis-a-vis new construction.

All projects included in the analysis were completed between 1975 and 1979. For the most part, the sample was drawn from a national base. However, for uninsured SHFA-processed Section 8, we restricted the analysis to nine states, including: California; Maryland, Massachusetts; Minnesota; Oregon; Pennsylvania; Tennessee; Vermont; Virginia; and Wisconsin. This restriction was made in the interest of reducing data collection costs, since information on uninsured projects had to be obtained through on-site visits to the individual agencies.

Table 1-1

PROGRAM VARIANTS INCLUDED IN THE ANALYSES

Program/Financing Variant	New Construction	Substantial Rehabilitation
SECTION 8		
1. 202/8	X	
2. HUD-processed		
a. FHA insured	X	X
b. 11(b) insured	X	
3. SHFA-processed		
a. FHA insured	X	X
b. Uninsured	X	X
PUBLIC HOUSING		
1. Turnkey	X	
2. Conventional	X	
SECTION 236 RENT SUPPLEMENT	X	
UNSUBSIDIZED 221(d)4/(d)3	X	

1.4 Contents of the Report

The purpose of this report is to document the assumptions and methodology used in the study and to examine the variations that exist across the different program types. The report is divided into seven chapters. Chapter 2 describes the major program and financing variants examined in the study. Chapter 3 describes the methodology in detail, including the definition of development costs; the procedures that were used to control for variations in the price of construction inputs across cities and over time; the basic data sources; and the sampling framework.

Chapters 4, 5, and 6 present the results of our empirical analysis. Chapter 4 describes the average costs and characteristics of projects developed under the different program variants. Chapter 5 presents the results of regression analyses that attempt to relate observed differences in development costs to the characteristics of the project, the sponsor, and the program variant. By comparing the costs of producing an identical unit under the different program types, the analysis is able to decompose average cost differences into those that are related to the characteristics of the project and those that relate to program efficiency. Chapter 6 examines a range of factors thought to account for the programmatic differentials uncovered by the regression analysis. Finally, Chapter 7 takes the observed differences in development costs across the different programs, and translates them into life cycle costs to the public sector.

Chapter 2

PROGRAM AND FINANCING VARIANTS

The study of multi-family development costs examines projects developed under four major multi-family production programs: the Section 8 New Construction/Substantial Rehabilitation program; Public Housing; Section 236 Rent Supplement; and unsubsidized FHA. Within these program types, several different program and financing variants have been identified and isolated for analysis. This chapter describes the program types examined in the study and reviews their relative contributions to multi-family production under HUD programs.

2.1 Section 8 New Construction/Substantial Rehabilitation

Since 1975, the Section 8 Rental Assistance program has served as HUD's primary vehicle for assisted housing production. Under the program, private developers construct new or substantially rehabilitated units for rental to low- and moderate-income households. Tenants are required to pay up to 30 percent of income towards rent, with HUD making up the difference between this amount and the rent on the unit.[1] Maximum unit rents are limited by a set of Fair Market Rents established for each market area and for different construction types.

Although the Section 8 program consolidated a number of previous assisted housing activities under a single subsidy

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[1]The previous rent to income ratio was a maximum of 25 percent. The new maximum is being phased in, beginning in 1981.

mechanism, the program encompasses a range of processing and financing combinations. Program regulations state that any type of financing may be used in conjunction with Section 8, including conventional financing, FHA insured mortgages, FmHA programs, and tax exempt bonds. While conventional financing was expected to play a sizeable role in the program, very little conventionally financed Section 8 has been built.[2] Rather, the bulk of Section 8 housing has been financed with below-market rate mortgages using tax exempt bonds, GNMA Tandem, or HUD's Section 202 program.

As shown in Table 2-1, completions under the Section 8 New Construction/Substantial Rehabilitation program have exceeded 300,000 units through 1981. The vast majority of these have been located in newly constructed buildings. Reservations under the program reached their peak in 1977 at roughly 180,000 units. In more recent years, however, reservations and starts have fallen off, reflecting both difficulties in obtaining project financing and growing concern about Section 8 costs.[3] As the program enters its eighth year, it is likely that very little, if any, new production activity will be authorized under Section 8. The current study isolates eight major Section 8 program variants, which together have accounted for more than three quarters of all Section 8 starts. These are described below with particular attention to the financing mechanism used.

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[2]Conventionally financed projects were excluded from this study both because of their small number and because certified costs for conventional projects are unavailable. Of all Non-SHFA Section 8 starts, fewer than 10 percent have involved conventional financing.

[3]Recent GAO reports have expressed alarm over the depth of the Section 8 subsidy, the relatively small number of beneficiaries served, and the high costs of the housing produced. High costs were attributed to HUD's emphasis on production at the expense of cost control and high levels of project amenities not normally found in subsidized housing.

Table 2-1

SECTION 8 NEW CONSTRUCTION AND SUBSTANTIAL REHABILITATION RESERVATIONS, STARTS, AND COMPLETIONS IN UNITS

Year	Reservations		Starts		Completions[1]	
	New	Rehab	New	Rehab	New	Rehab
1975	20,921	2,664	2,369	326	278	196
1976	100,568	12,120	41,668	4,292	2,442	445
1977	163,477	25,967	93,429	12,916	14,169	2,573
1978	94,033	18,428	131,179	18,264	36,906	5,081
1979	121,518	35,556	115,045	20,906	70,345	9,394
1980	89,818	21,328	96,928	29,993	84,576	9,216
1981	45,283	10,452	48,162	9,764	82,675	17,533
TOTAL	635,618	126,515	528,780	96,461	291,391	44,438

[1]Completions do not include 202/8 (includes FmHA, NSA, etc.).

Source: Section 8 MIS.

2.1.1 FHA Insured Section 8 (221(d)4 and (d)3)

As shown in Table 2-2, HUD processed (non-SHFA) projects have accounted for 300,544 units, or about half, of all Section 8 starts over the past seven years. Nearly 75 percent of these projects have been financed with FHA insured mortgages, making the HUD-processed, HUD-insured variant the most commonly used Section 8 type.

The insurance programs most widely used with Section 8 rental assistance are Section 221(d)4 and Section 221(d)3. Under the d(4) program, HUD insures private mortgages for up to 90 percent of a project's replacement cost. Section 221(d)3 is used primarily by non-profit sponsors, who may receive insurance for 100 percent of replacement cost. Under both programs, maximum per unit cost limits are statutorily set and are intended to assure modest quality construction. While FHA insurance is not a financing mechanism per se, it does play a key role in the financing of projects assisted under Section 8.

Mortgages insured under the Section 221 programs are eligible for financing subsidies through the GNMA Tandem Plan. Under the Tandem Plan, GNMA subsidizes loans to developers of low-income housing by purchasing mortages made by private lenders. Interest rates on these mortgages are administratively set at below market rates (7.5 percent during the period of this study). Once construction is complete, GNMA buys the mortgage and in turn sells it at a discount to investors through its secondary mortgage market operations. The program thus encourages lenders to provide mortgages for low-income housing and provides the below market rates needed to make the projects feasible. The cost of the program is the discount GNMA absorbs when it sells the below market loan at prices low enough to give investors a market yield.

As noted above, GNMA financing has been used extensively in the Section 8 program. The current study includes both new and rehabilitated projects with 221(d)4 or (d)3 insurance, 87 percent of which have benefited from the GNMA discount point subsidy.

Table 2-2

SECTION 8 NEW CONSTRUCTION AND SUBSTANTIAL REHABILITATION:
STARTS BY PROGRAM IN UNITS

Year	SHFA	Non-SHFA	202/8	FmHA	Property Disposition	NSA
1975	1,564	1,131				
1976	24,078	21,617	265			
1977	33,587	61,292	7,111	3,873	476	
1978	40,346	78,428	19,978	9,615	1,076	
1979	39,199	59,700	24,180	11,191	--	1,681
1980	32,707	56,935	20,742	7,292	72	9,176
1981	6,797	21,439	17,136	9,004	696	2,854
TOTAL	178,278	300,544	89,412	40,975	2,320	13,711

Source: Section 8 MIS.

2.1.2 Projects Financed by State Housing Finance Agencies

State Housing Finance Agencies are a growing force in low-income housing and have taken an active role in the production of Section 8 housing. Through 1981, nearly a third of all Section 8 New Construction and Substantial Rehab starts were processed through SHFAs.

In the Section 8 program, SHFAs act as mortgage lenders, providing construction and permanent financing to developers of Section 8 projects. Interest rates on SHFA mortgages are generally lower than conventional rates by virtue of the agencies' tax exempt borrowing power. While the costs of tax exempt financing have recently attracted much criticism, the benefits have been interest rates low enough to make projects feasible within rent limits. Moreover, developers often prefer to work through a SHFA because of special Fast Track processing available for state-financed, noninsured projects.

State agencies may or may not require HUD mortgage insurance for the projects they finance. In general, SHFAs lend without FHA insurance, although many of the mortgages are privately insured. Through 1981, only about 20 percent of all SHFA starts used HUD insurance. Nevertheless, the development cost analysis examines both types of projects. The analysis also distinguishes between new and rehabilitated SHFA projects.

2.1.3 Section 11(b) Bonds

Under Section 11(b) of the 1937 Housing Act, public housing agencies[4] may issue tax exempt bonds to finance lower income housing projects. Virtually all local agency financing of Section 8 is now financed through 11(b) bonds. The projects may be privately owned, or owned and operated by the authority.

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[4]Local housing authorities, municipalities, other governmental bodies and their agencies and instrumentalities.

While 11(b) projects are comparatively few, there is reason to believe that 11(b) bonds are an increasingly important means of financing Section 8 projects. Some 15 percent of all Section 8 projects entering construction in 1980 used this mechanism. The advantage of 11(b) is the low interest rate available through tax exempt borrowing. Moreover, the interest rates on 11(b) financed mortgages are somewhat lower than those on SHFA mortgages because PHAs which issue 11(b) bonds do not typically add a service charge to the bond rate. Like SHFA financing, however, 11(b) bonds are often criticized as an inefficient and expensive means for providing subsidized housing.

The analysis of multi-family development costs includes only new construction 11(b) financed projects with FHA insurance. Uninsured 11(b)s were excluded due to problems of data availability.

2.1.4 Section 202/8

The Section 202 program was enacted in 1959 to provide direct federal loans to non-profit or limited dividend sponsors building housing for the elderly and handicapped. Loans were originally made for up to 50 years at a 3 percent interest rate. However, the program was administratively halted in 1969 when the Section 236 program was introduced.

Section 202 was revived in 1974 with two important changes. First, the interest rate was changed to reflect the prevailing cost of Treasury obligations, plus an administrative fee. Second, projects financed with 202 loans were made eligible for the new Section 8 rental assistance program. By 1975, HUD had required that all proposed 202 projects participate in the Section 8 program.

During the period of this study, 202/8 loans were approved for a total of 88,100 units, with program activity holding relatively steady at roughly 20,000 units per year. The 202/8 program has been a comparatively small component of the Section 8 program, and has traditionally focused on new construction projects.

2.2 Public Housing

The traditional low-rent Public Housing program is the natural point of departure for comparing costs among different housing production mechanisms. Serving as the nation's principal vehicle for subsidized housing for more than 40 years, the Public Housing program contrasts sharply with Section 8 in most of the factors thought to affect development costs. A major objective of the current study, therefore, is to compare Public Housing with the more flexible Section 8 program.

While there are several methods for providing Public Housing, this study focuses on the two most common methods: Conventional and Turnkey. Both methods are administered by local Public Housing Authorities, of which there are currently more than 3,000 in operation across the country.

Under the Conventional Public Housing program, local authorities plan and contract for the construction of Public Housing projects. Projects are financed through the sale of tax-exempt bonds which carry a federal guarantee. The government pays the debt service on the bonds, so that tenant rents reflect only maintenance, operating costs, utilities and any payment made for local taxes. Conventional projects make up the bulk of the Public Housing program.

The second major method of Public Housing production, known as Turnkey, was introduced in 1967. Under this system, a private developer enters into a contract with the PHA to design and build a project. Upon completion, the developer sells the project to the authority within the ceiling price specified in the contract. The developer is responsible for all aspects of construction including the provision of construction financing.

The introduction of private "Turnkey" developers into Public Housing production was originally welcomed as a means of reducing development costs and increasing program activity. Since 1970, for example, more than half of all Public Housing projects entering the program have used the Turnkey method. Moreover, in 1977 HUD required that PHAs use Turnkey in all cases unless they could prove

that the Conventional method would be cheaper or that the Turnkey method could not be used. This reflected the prevailing view that the Turnkey method was more efficient than Conventional Public Housing, primarily because of its typically shorter construction period. Nevertheless, development costs under the Turnkey program reflect the higher interest rates produced by the use of conventional construction financing. Critics of the Turnkey program have also charged that the program is sometimes used by developers to unload undesirable sites. Thus, in recent years enthusiasm for Turnkey production has been somewhat muted.

The traditional Public Housing program as a whole has suffered a number of setbacks over the past dozen years. (See Table 2-3 for construction activity trends.) In 1969, for example, rising costs had begun to push Public Housing rent levels beyond the means of low-income tenants. In that year, Congress limited tenant rents to 25 percent of income; operating subsidies were instituted to cover the shortfall. In 1973, the program was suspended entirely, and Public Housing, along with several other subsidized housing programs, was to be replaced by the new Section 8 Rental Assistance program authorized the following year.

By 1977, however, the Public Housing program was reinstituted by Congress. The program's revival was attributed to Congressional dissatisfaction with the pace of production under the new Section 8 program. Moreover, a Congressional Research Service report released in mid-1976 had shown Public Housing subsidy costs to be lower than those of Section 8.[5] Recent GAO reports have produced similar results and, significantly, recommended increased use of Public Housing in place of Section 8.[6]

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[5]Congressional Research Service, Comparative Costs and Estimated Households Eligible for Participation in Federally Assisted Low Income Housing Programs. 1976.

[6]GAO, Evaluation of Alternatives for Financing Low and Moderate Income Rental Housing. PAD-80-13. September 30, 1980.

Table 2-3

LOW-INCOME PUBLIC HOUSING UNDER HOUSING ACT OF 1949:[a]
Yearly Trend in Contract and Construction Activities,
1950-1979

Calendar Year	Active Housing Units		
	Placed under Annual Contributions Contract	Placed under Construction or Rehabilitation[b]	Made Available for Occupancy
1950-59	351,612	277,169	252,015
1960	11,437	29,209	16,401
1961	27,867	30,493	20,965
1962	25,094	22,402	28,682
1963	36,031	24,030	27,327
1964	37,429	25,591	24,488
1965	26,281	33,298	30,769
1966	43,514	31,999	31,483
1967	70,277	34,015	39,021
1968	77,801	71,606	72,638
1969	108,783	64,231	78,003
1970	101,932	104,410	73,723
1971	58,228	72,230	91,539
1972	80,319	44,760	58,590
1973	33,453	27,807	52,791
1974	22,438	19,050	43,928
1975	12,858	15,090	24,514
1976	4,286	9,907	6,862
1977	3,440	6,321	6,229
1978	9,371	11,835	10,295
1979	59,186	23,653	44,019
Total	1,201,637	979,106	1,034,232

[a]Includes Indian Housing

[b]Includes construction and rehabilitation starts under the old leased housing program

Source: HUD Statistical Yearbook, 1979.

2.3 Section 236 Rent Supplement

The Section 236 Rental and Cooperative program was authorized by Congress in 1968. Designed to replace the 221(d)3 BMIR program, Section 236 used interest rate subsidization as a means of meeting production goals for lower income housing. This mechanism proved to be quite successful in encouraging developer participation, resulting in very high levels of program activity. Overall, Section 236 produced more multi-family housing units in only a few years than any other multi-family insurance program, and more total units than every other subsidy program except public housing.

Nevertheless, Section 236 was the object of considerable criticism, primarily for its high default rate and its costly combination of subsidies.[7] As a result, Section 236 was suspended during the housing subsidy moratorium of 1973. The program is currently inactive and program activity since 1973 has primarily consisted of funding bonafide commitments issued before the moratorium and amending existing contracts. (See Table 2-4.)

All Section 236 housing is privately owned and financed. The basic subsidy mechanism provided under the program consists of federal interest reduction payments which allow project owners to charge rents well below market levels. These payments are equal to the difference in monthly installments between amortization at the FHA ceiling rate (plus insurance premium) and amortization calculated at 1 percent. Tenants pay the basic rent (operating costs plus amortization at 1 percent) or 25 percent of adjusted income, whichever is greater.

In addition to interest subsidy, several other subsidy mechanisms have been used in conjunction with Section 236.[8] The

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[7] A 1972 Internal HUD Audit also found that Section 236 projects had higher costs than conventional projects and that architectural fees and land valuation were excessive.

[8] These include GNMA Tandem which was used extensively in the 236 program and tax exempt bond financing provided by state housing finance agencies.

Table 2-4

SECTION 236 NEW CONSTRUCTION MORTGAGES
INSURED BY FHA

YEAR	NUMBER OF UNITS
1965-69	11,090
1970	93,162
1971	91,355
1972	83,096
1973	54,758
1974	23,385
1975	14,984
1976	11,275
1977	2,871
1978	1,201
1979	415
TOTAL	386,565

Source: HUD Statistical Yearbook, 1979.

most important from the point of view of this study is the Rent Supplement program. Rent supplements were available for tenants in 20 percent of the units in approved Section 236 projects. Paid directly to project owners on behalf of eligible tenants, rent supplements could reduce a tenant's contribution to as little as 30 percent of the basic rent. This combination allowed the Section 236 program -- which was primarily designed for moderate income families -- to reach a subgroup of lower income households eligible for public housing. Like Section 236, however, the ability to make additional commitments under the Rent Supplement program was suspended in 1973, with subsequent activity limited to amending contracts for existing Rent Supplement projects and converting Section 236 Rent Supplement units to Section 236 "deep subsidy" assistance as provided by the HCD Act of 1974.

2.4 Unsubsidized FHA

In addition to the subsidized program variants described above, the current study includes one unsubsidized project type: non-Section 8 projects with FHA insurance under Section 221(d)4 or (d)3. These projects provide virtually the only available basis for comparing the development costs of subsidized versus unsubsidized housing.

As noted above, Section 221(d)3 and (d)4 are HUD's principal insurance programs aimed at the production of rental housing for low- and moderate-income households. Section 221 originally included a below market rate component and was also used in conjunction with the Rent Supplement program mentioned earlier. More recently Section 221 has been used extensively with Section 8.

While FHA insurance has been increasing used in combination with various types of subsidies and mortgage market supports,[9] the basic 221 programs still produce a sizeable number of unassisted units which may serve as comparables for the subsidized housing types described above. Unsubsidized completions over the study

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[9]Unsubsidized FHA projects are eligible for discount point subsidies under GNMA's Tandem Program 21. Some GNMA financed projects are included in the unsubsidized FHA sample.

period (1975 to 1979) totaled roughly 78,000 units. This may be compared to an average overall program rate of about 50,000 units insured per year, taking into account a rather significant downturn in program activity in the recession years immediately preceeding the study period.

Although unsubsidized FHA projects cannot be used as proxies for "private market" developments, they do provide a readily available source of data for examining cost differences between subsidized and unsubsidized housing types. Section 221(d)3 and (d)4 projects offer the additional advantage of being produced under program controls designed to limit projects to "modest quality" construction. Thus, they should be more comparable to the subsidized types examined in the study.

2.5 Production Trends for Subsidized Housing

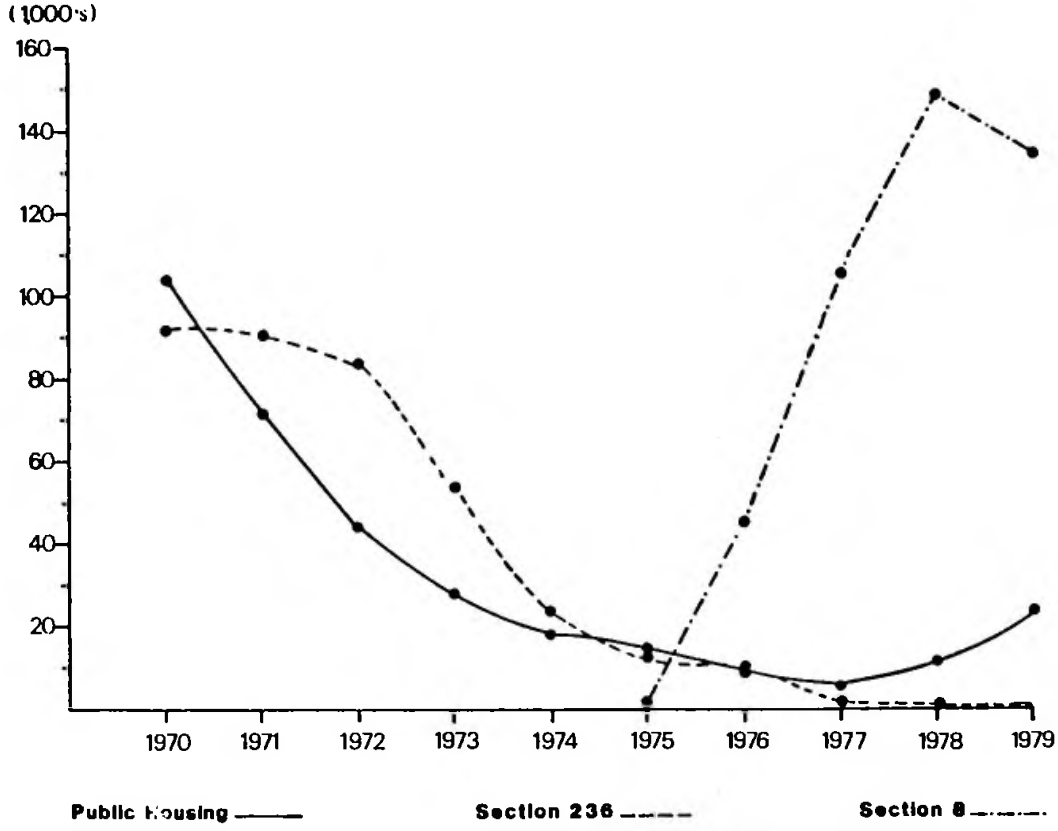
As indicated by the preceeding discussion, subsidized housing production under Section 8, Section 236, and Public Housing has provided a substantial number of new or rehabilitated units for low and moderate income households. Public Housing is the oldest and most prolific program, with over a million units produced since 1939. Section 8 and Section 236 have contributed on the order of 300,000 and 400,000 units respectively, these over the space of seven or eight years.

Figure 2-1 shows starts under each of the three programs for the past decade. Public Housing starts declined from an all time high of over 100,000 units in 1970 to a mere 6,321 units in 1977. Activity has increased only slightly since. Section 236, which only got underway in 1970, accounted for almost as many starts as Public Housing in that year, but was suspended in 1973.

Since the suspension, Section 8 has served as HUD's principal subsidized housing program. Starts under Section 8 rose rapidly through 1978, achieving levels comparable to combined 236 and Public Housing starts during the early 70s. Since 1978, however, Section 8 starts have fallen off considerably -- down to about 60,000 units in 1981.

FIGURE 2-1

Section 8 and Public Housing Starts ; Section 236 New Construction Mortgages Insured



Chapter 3

METHODOLOGY

This chapter presents a detailed account of the basic methodology underlying our analysis of development costs. It begins with a discussion of the definition of development costs, and highlight problems that arose in some of the attempted cost comparisons. It then describes the statistical procedures that were used to translate nominal dollar amounts into measures of "real" development costs, where the latter controlled for differences in the price of construction inputs across cities and over time. The third section of the chapter describes the data that were used to characterize the project and its sponsor; while the final section presents a detailed discussion of the sampling strategy, along with some basic statistics on the number and types of projects that were included in the analysis. A detailed discussion of the data collection effort appears in Appendix A.

3.1 The Definition of Development Costs

The most critical step in the analysis design was the formulation of a framework that could be used to derive comparable measures of development costs. Because the form and content of available data varied across the programs being compared, it was crucial to create a scheme for the calculation of a uniform cost measure that was both responsive to the objectives of the analysis and realistic in its ability to describe the costs of the various housing programs.

The overwhelming majority of program and financing variants included in this study use the FHA cost-reporting system. As a result, the cost categories that have been established by that system have been used as the cornerstone of our research. Total development costs are defined as the sum of eight major components, including: (1) land; (2) improvements (i.e. labor and materials); (3) construction period carrying charges; (4) program filing and financing fees; (5) legal, organizational, and audit costs; (6) offsite costs; (7) other miscellaneous costs; and (8) profit. The various items that are included under each of these categories are listed in the first column of Table 3-1, along with their location on the pertinent FHA forms.[1]

With the exception of land, the FHA cost data used in the analysis represent certified project costs. However, the cost of land refers to its "estimated market value," as opposed to its transfer price. For rehabilitated projects, this estimate will include the pre-rehabilitation value of the shell. Use of estimated market values -- or more precisely, the value of the property that is recognized in the mortgage -- enabled us to avoid problems associated with transactions occurring considerably before the project's development date or between parties with mutual interests. However, since the land allowance is often a negotiable part of the mortgage process, our estimates may contain a certain amount of noise.

One should also note that the definition of profit that is used in our analysis only includes the Builder and Sponsor Profit and Risk Allowance (BSPRA) or -- in instances when there is no identity of interest between the sponsor and the builder -- the allowable builder's fee. Such "profit" estimates may bear only a loose relationship to the actual

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[1]Appendix F presents the FHA reporting forms used in this analysis, along with analogous forms for individual SHFAs and Public Housing.

Table 3-1

DEFINITION OF DEVELOPMENT COSTS

FHA REPORTING SYSTEM	PUBLIC HOUSING REPORTING SYSTEM
TOTAL IMPROVEMENTS 1. Construction Costs (2330/line 1a or 1b)* 2. Architect's Fees a. Design (2330/line 2a) b. Supervision (2330/line 2b)	1. Site Improvements (52484/lines 2 + 47) 2. Dwelling Construction (52484/lines 3 + 48) 3. Dwelling Equipment (52484/lines 4 + 49) 4. Nondwelling Construction (52484/lines 5 + 50) 5. Architectural and Engineering Fees and Fees and Expenses (52484/lines 7 + 11 + 28) 6. Minus Liquidated Damages (52484/line 21)
CONSTRUCTION PERIOD CARRYING CHARGES 1. Interest (2330/line 3) 2. Taxes (2330/line 4) 3. Property Insurance (2330/line 5)	1. Total Interest (52484/line 26) 2. Turnkey Developer's Other Costs (52484/line 8)
LAND 1. Land (2580/line 5) 2. Offsite Costs (2330/line 12)	1. Site Acquisition Costs (52484/lines 1 + 46) 2. Relocation (52484/line 53)
PROGRAM FINANCING AND FILING FEES 1. MIP (2330/line 6) 2. FHA Fees a. Examination Fee (2330/line 7) b. Inspection Fee (2330/line 8) 3. Title and Recording Fees (2330/line 9) 4. Financing Fees (2330/line 10) 5. FNMA/GNMA Fees (2330/line 10)	1. Planning Costs, Excluding A&E Fees (52484/lines 34-28) 2. Administration, Excluding Technical Salaries (52484/lines 20-11) 3. Non-Dwelling Equipment (52484/lines 6 + 51) 4. Contingency Fund (52484/line 57)
LEGAL, ORGANIZATION, AUDIT COSTS (2330/line 11)	
MISCELLANEOUS OTHER DEVELOPMENT COSTS 1. Consultants Fees 2. AMPO 3. Supplemental Management Funds 4. Contingency Reserves 5. Other Unspecified Costs (2330/line 13)	
PROFIT 1. Builder's Profit (2330/line 1c) 2. BSPRA (2330/line 14)	

*Items in parentheses refer to FHA Forms 2330, 2580, or 52484 and the appropriate line numbers on the form. See Appendix F for copies of the actual forms.

profits that are realized on the project. In particular, they ignore any additional returns to the developer that accrue from syndication.

The major conceptual problems associated with the measurement of development costs arose from the fact that several of the program variants did not employ the FHA's system of reporting costs. These included two types of uninsured, SHFA Section 8 projects, as well as traditional Public Housing. As a result, the analysis had to develop some basic algorithms that enabled us to go from the cost records of these two program variants to information that was roughly comparable to FHA statistics. While this step was fairly straightforward for uninsured SHFAs, the problems encountered for Public Housing were more difficult to resolve.

3.1.1 Uninsured SHFA Section 8

Most state housing financing agencies have adopted forms for recording project development costs that are fairly similar to those employed by the FHA. The fees applied by SHFAs closely parallel the program financing and filing fees associated with FHA projects, and the other components of development costs have roughly comparable definitions. However, there was no standardized form that was used by every agency. As a result, some manipulation of the various costs and fees was required to produce statistics that are directly comparable to FHA data. Such manipulations were made after extensive conversations with Certified Public Accountants familiar with the cost certification process, and with individual SHFAs.

3.1.2 Public Housing

The problems encountered in deriving comparable measures of development costs for public housing were considerably more complex. Some of the items that are treated as allowable costs for public housing -- for example, the initial operating deficit -- are not recognized or required by the FHA system; and many of the items that appear in FHA records -- for

example, some of the program financing and filing fees -- have no obvious counterpart in Public Housing. In order to make statements about the costs of public housing vis-a-vis the other program and financing variants, we first had to identify basic components of development costs whose definitions are roughly the same.

The second column in Table 3-1 classifies various components of public housing development costs into categories that correspond to the FHA definitions presented in Column 1. In general, there are three categories of costs for which more or less comparable data are available: land; improvements; and construction-period carrying charges. PHA administrative and planning costs are less obviously matched with a particular FHA cost component. For turnkey projects, they may be analagous to program financing and filing fees, assuming that those fees approximate area office processing costs. For conventional projects, they may be more analogous to the BSPRA, assuming that this allowance approximates the developer's outlay of money and time.

Given these ambiguities, PHA planning and administrative costs could not be compared to any particular FHA cost component. However, they were used to derive a measure of "total development costs," which is simply the sum of the various cost components presented in Column 2. One should recognize that this sum is different from the definition of total costs employed in the Public Housing Program. In particular, it excludes the initial operating deficit and any offsetting impact of donations.

Even with this respecification of total costs, comparisons between public housing and the other program variants are problematic. To begin with, the public housing data are not always certified. Although certification is required for conventional projects, typically it does not occur until three years after the end of construction. As a result, the analysis also relied on expenditure data reported in final development cost budgets submitted upon project completion. These budgets

sometimes include maintenance expenditures incurred in the initial years of operation, and thus may overstate actual construction costs. An analogous problem arises with the measurement of interest costs during construction. Since expenditures to date may refer to a period that extends beyond the construction phase, this component of development costs may be exaggerated.

Additional problems arise with available data for turnkey projects. Since turnkey projects are essentially fixed price contracts, reported and actual expenditures in any category may differ to a large extent. For example, we found that existing forms seldom had information on the developer's carrying charges although such data should have been recorded. Since developers obviously incur such expenses in the process of developing projects, one has to assume that these costs are buried in land or improvements. Thus, in such instances, costs will be shifted from carrying charges to improvements. However, this shift will not affect total development costs.

Another problem that should be recognized relates to differences in the treatment of profit in the measurement of construcion costs. For conventional Public Housing, improvements costs will always include a builder's fee.[2] While builder's fees are theoretically identified for state-financed and FHA projects, they are a relatively rare phenomenon; builders and developers stand to make more if they share an identity of interest and claim a BSPRA. While it would have been possible to allocate part of the BSPRA to the FHA's

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[2]A similar problem arose for a small number of FHA and SHFA projects in the sample involving non-profit developers with fixed-price construction contracts. However, statistical procedures were developed in the regression analysis that correct for this phenomenon. (See Chapter 5.)

definition of improvements costs, such procedures would have been arbitrary. The net result of all these factors is that improvement costs for Public Housing projects will include a higher proportion of "soft" development costs than analogous data for Section 8 and unsubsidized FHA projects.

A final problem relates to Public Housing's definition of land costs, which is not strictly comparable to FHA's. In our analysis, land costs for Public Housing include all expenses recorded under site acquisition, including relocation.[3] This definition recognizes any expenditure incurred by the PHA or the turnkey developer as part of the site acquisition process, which may be only loosely related to the market value of the land; it also includes certain categories of costs that would not be recognized by FHA. However, since there was no obvious way to adjust the PHA data to conform to the concepts used by FHA, we were forced to use the program's own definition of land.

All of these factors must be borne in mind in comparing the relative costs of public housing vis-a-vis the other program variants. Indeed, in the presentation of the results, we have tried to be specific about the various caveats regarding the comparability of the different data items. However, it is important to recognize that these potential biases are typically fairly small and that in some instances, we were able to correct the data through statistical means. Thus, given the relatively large cost differentials that are uncovered in our analysis, the principle findings presented in this report can not be attributed to problems in measuring project costs.

3.2 Procedures Used to Deflate Development Costs

A second major component of the analysis design involved the deflation of costs from nominal to constant dollars. As described in a subsequent section, the projects included in the

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[3]Relocation expenditures are also included in FHA's appraised value of the land.

analysis are located throughout the country and were developed over a five year period. Since the underlying cost of construction inputs has obviously varied over time and place, it was necessary to translate nominal dollars into "real" costs before making any program or project comparisons. The general procedures used to accomplish this task are described in the paragraphs below; a more detailed account of our methodology is presented in Appendix H.

The Dodge Construction Index

All components of development costs other than land were adjusted by using data derived from the Dodge Building Cost Calculator and Valuation Guide. This guide presents a time-series index of construction prices based on labor and materials costs in 183 different cities throughout the country. For projects outside these areas, we used the index value for the nearest available city.[4] The base year in every city varied, reflecting the year that it was added to the sample. However, since local costs were also expressed as a proportion of the New York City average, some simple calculations enabled us to derive an index that translated nominal development costs into 1980 equivalents for the average location in the sample.

To get some feel for what is meant by an "average priced" location, it may be illustrative to list some cities with varying values of the construction index. Areas with extremely

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[4]Any additional labor and materials price differential between rural and urban areas should be captured in the regression analysis presented in Chapter 5, which included variables that distinguished between central city, suburban, and non-metropolitan areas. Such variables had a significant impact on the cost of land, but had a negligible effect on total development costs.

high index values are concentrated in the North East and the West, and include New York and a host of California cities (e.g., San Francisco, Los Angeles). "Average" priced areas are predominately Midwestern, and include cities such as Des Moines, Iowa, and Charlestown, West Virginia. And, finally, cities with below average prices fall mainly in the South, with the lowest values in Macon, Georgia, and Greensville, South Carolina.[5]

Land Price Deflator

Although the Dodge Index is based on materials costs and wages, most of the soft components of development costs tend to be proportional to improvements, and vary over time and place in a roughly comparable manner. As a result, we deflated most of the components of development costs with the Dodge Construction Index. However, such consistency could not be expected to hold in the case of land. Since its price could vary in ways unrelated to the price of construction inputs, we decided to use a different index for this component of a project's costs.

While some data exist which might have been used to construct a national index for the price of land, none were sufficiently detailed or comprehensive to be included in this analysis. As a result, we derived a land price index based on data from our actual sample. To do this, we first estimated a regression equation that related variations in the unit price of land to a series of variables expected to influence property values, including the project's location and development date. To avoid price variations due to programatic differences in the definition of land, we restricted this analysis to newly constructed FHA projects.

We then used the estimated regression equation to construct an index that controlled for unit land price variations

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[5]The specific value of the index ranged from a high of 1.06 in Long Beach, California to a low of 0.67 in Macon, Georgia. The average value in our sample was 0.86.

across cities and over time for our entire sample of projects. To make this index roughly comparable to the Dodge deflator -- which is based on metropolitan-wide statistics -- we based our index on a subset of the variables appearing in the land equation, including: (1) year; (2) geographic region; (3) size of the metropolitan (or non-metropolitan) area; and (4) central city location. The "adjusted" land values that are used in our analysis are roughly equivalent to the Dodge-corrected measures of construction costs, and represent the value of the project's land in 1980 dollars in an "average-priced" location.[6]

Another methodological issue related to the treatment of land involved the proper deflator to use in the case of substantial rehabilitation. For such projects, the reported value of land will include the value of the building as well as the property. Presumably, one could make an argument for either the Dodge or the Land Price index. However, since we believed that the values of properties typically used in substantial rehabilitation tend to be dominated by their land and not their shell, we decided to deflate such costs by the Land Price Index.

3.3 Describing Projects and Their Sponsors

Another key aspect of the analysis design is the nature and the quality of the data that are used to describe the projects and their sponsors. One of this study's major objectives is to identify the relative costs of developing an identical unit under the different program variants. To do this, one must have detailed information on a host of different factors thought to influence development costs. Accordingly, this section describes the data sources (other than costs) that were in

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[6]When we use these corrected values in the regression analysis of the value of land per dwelling unit, we do not need to include the variables that were used to construct the Land Price Index.

the analysis. These data can be grouped into three major categories based on the nature of the information that they provide, including: (1) project characteristics; (2) developer characteristics; and (3) key processing dates and location.

3.3.1 Project Characteristics

As with the measurement of development costs, information available from standard FHA reporting forms provided most of our data on the physical attributes of the projects. All FHA program variants (including 202s) submit a HUD Form 2013 at various stages of the processing cycle. The information provided by this form is summarized in Table 3-2. As is evident from this chart, such data present a fairly detailed description of the project's characteristics, including: size, structure type, exterior finish, bedroom and bathroom count, lotsize, and dwelling equipment and amenities. The 2013 also provides data on the sponsor's basic type.

In order to obtain the most accurate information on the project, we collected the 2013 that was submitted at firm commitment. Comparable information for uninsured SHFA projects was typically available from application forms maintained by the individual SHFAs; when it was not, we collected such data from the project's developer. In the case of Public Housing, all data were collected from the PHAs.[7]

3.3.2 Developer Characteristics

Most of our information regarding the project's sponsor was obtained through a developers' survey, which in the case of Public Housing was always defined as the PHA. In addition to

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[7]Although HUD has processing forms that record project characteristics for Public Housing (HUD Form 51885), they do not provide information on unit size and project equipment and amenities. As a result, they could not be used.

Table 3-2

DATA AVAILABLE FROM HUD FORM 2013

1. Sponsor Type

- Profit motivated
- Limited dividend
- Non-profit

2. Building Type

- Row house/townhouse
- Walk-up/garden
- High-rise

3. Project Size

- Number of buildings
- Number of units
- Average number of stories

4. Exterior Finish

5. Unit Size and Type

- Average number of bedrooms per unit
- Average square feet per unit
- Average number of bathrooms per unit

6. Equipment and amenities

- Range
- Refrigerator
- Air conditioning
- Kitchen exhaust fan
- Disposal
- Dishwarsher
- Intercom
- Balcony
- Playground
- Swimming pool
- Community room
- Tennis courts

7. Lot Size

collecting data on the size and the nature of the organization, we also collected data on the developer's previous experience, his assessment of the project's neighborhood, his overall views on program processing and cost controls, and the syndication status of the project. While we were able to complete these surveys for only about half of our overall sample, information obtained from this source represents a valuable addition to our analysis.

3.3.3 Project Location and Key Processing Dates

The final source of data for our analysis came from various computerized information systems maintained by HUD, including: (1) FORMS: (2) MIDLIS: and (3) the Section 8 MIS. Such data were used to generate the sample and also to collect information on the project's number of elderly units, its key development dates, and its precise location. Once the location of the project was identified, we used HUD's Master Locality File to identify the size of the place, and to distinguish between metropolitan and non-metropolitan areas, and between central city and suburban locations.

3.4 A Description of the Sample

The fourth major aspect of the analysis design involved the formation of a sampling scheme. In devising this scheme, we were guided by two basic objectives. The first objective was to obtain reliable estimates of differences in development costs across the different program/financing variants. As a result, we elected to over-sample projects within the smaller programs in an attempt to avoid unacceptably small sample sizes for those variants.

We also wished to devise estimates of development costs that -- to the maximum extent possible -- controlled for differences in the types of projects developed. As a result, we decided to stratify the universe of projects into a number of discrete project types, and then to select a similar mix of projects for each of the twelve basic program variants.

Although it was impossible to completely equalize the mix of project types -- for example, there are no family projects in the 202/8 program -- adoption of this stratified sampling approach enabled us to achieve a sample that was much more comparable in terms of the types of units developed. However, while this sampling framework was desirable for our analysis of comparative costs, we had to weight the resulting data to obtain estimates of actual averages.[8]

The remainder of this section describes the sampling framework in more detail, and presents some basic data on the characteristics of the sample. As these data will reveal, the sample used for the analysis is relatively rich and should provide reasonably accurate measures of interprogram differences in development costs.

Stratification Scheme

As noted above, the sample for the analysis of development costs was generated using a stratified random sampling scheme. Four basic stratifiers were employed: (1) program/financing variant (12 categories); (2) project size (3 categories); (3) project type (2 categories, defined as family versus elderly); and (4) completion date (2 categories). This stratification scheme gave rise to a 12x3x2x2 matrix with 144 different cells.

The size categories were selected by examining the distribution of all Section 8 New Construction and Substantial Rehabilitation projects completed between January 1975 and December 1979. Such projects fell into three roughly equal groups defined by: 1 to 49, 50 to 99, and over 100. To avoid outliers based on an unusually small project size, we eliminated all projects with four or fewer units. Thus, the size categories employed in the analysis were: 5 to 49, 50 to 99, and 100 or more.

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[8]The unweighted data are presented in Appendix C.

Project type was defined as either "elderly" or "mixed or family." This classification was made by comparing the project's total unit count with its number of elderly units.[9] If the difference was two or less, the project was defined as elderly; otherwise, it was classified as mixed or family. Two additional categories were created according to the project's completion date: (1) 1975 through 1978; and (2) 1979.[9] Elimination of more recent projects was necessitated by the fact that the requisite cost certification data were less likely to be available.

Distribution of Projects

Table 3-3 shows the actual distribution of projects completed between 1975 and 1979 for the relevant program financing variants. Data used to generate this chart were obtained from three basic sources: (1) the Section 8 MIS; (2) FORMS; and (3) MIDLIS.[10] About 4,000 projects fell within the universe of projects defined by program/financing variant and completion date (1975-1979). From this total, approximately 1,400 were selected for analysis.

Table 3-4 shows the sample sizes that were chosen for each of the 144 cells. In five instances where there were fewer than 120 observations for a given program/financing variant, we attempted to sample the universe of projects. This included: (1) 202/8 new construction; (2) 11(b) insured new construction;

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[8]Total number of units refers to all units, whether or not they are occupied.

[9]Completion dates were defined in different ways for the different program variants. For Section 8 projects the completion date was defined as the date of execution of the HAP contract; for Public Housing, it was defined as the "date of full availability" (DOFA); and for 236 and unsubsidized 221(d)(4) projects, it was defined as the date of final endorsement. All three dates approximate the end of the construction period.

[10]The only exceptions were Section 8 11(b) projects, which were identified from a separate listing obtained from HUD.

Table 3-3

DISTRIBUTION OF THE UNIVERSE OF PROJECTS BY SIZE, TYPE, AND COMPLETION DATE

		Number of Units		5 - 49				50 - 99				100 or More				TOTAL
		Type		Family		Elderly		Family		Elderly		Family		Elderly		
		Date		75-78	79	75-78	79	75-78	79	75-78	79	75-78	79	75-78	79	
Section 8	New Construction	HUD	202[a]	0	0	0	16	0	0	3	23	0	0	15	66	123
			FHA[b]	32	43	53	50	58	57	123	71	51	51	78	73	740
			11(b) Insured	1	2	0	2	0	3	2	9	0	6	2	8	35
		SHFA	FHA	7	9	12	4	11	18	14	8	3	11	16	12	125
			Uninsured	55	55	94	71	31	32	46	35	44	37	72	33	605
	Substantial Rehabilitation	HUD	FHA	10	2	3	5	17	14	3	6	8	12	7	11	98
		SHFA	FHA	4	1	1	0	0	2	3	2	4	1	2	3	23
			Uninsured	21	4	10	13	6	6	3	3	8	4	7	8	93
Low Income Public Housing[c]			Turnkey	80	30	19	8	64	6	40	3	41	2	50	8	351
			Conventional	62	7	20	4	57	9	22	1	46	6	37	3	274
Section 236 Rent Supplement (HUD Processed)				144	1	11	2	247	0	24	2	342	3	67	27	870
Section 221(d)4 (Unsubsidized)				91	14	1	0	157	54	5	1	250	107	3	2	685
TOTAL				507	168	224	175	648	201	288	164	797	240	356	254	4,022

[a]Excludes Handicapped Projects.

[b]Statistics adjusted to exclude insured 11(b)s.

[c]Excludes Indian Housing.

Table 3-4

DISTRIBUTION OF INITIAL SAMPLE BY SIZE, TYPE, AND COMPLETION DATE

		Number of Units		5 - 49				50 - 99				100 or More				TOTAL
		Type		Family		Elderly		Family		Elderly		Family		Elderly		
		Date		75-78	79	75-78	79	75-78	79	75-78	79	75-78	79	75-78	79	
Section 8	New Construction	HUD	202[a]	N/A	N/A	0	15	N/A	N/A	1	21	N/A	N/A	11	59	107
			FHA[b]	15	15	15	15	15	15	15	15	15	15	16	15	181
			11(b) Insured	1	2	0	0	0	3	2	8	0	6	1	6	29
		SHFA	FHA	7	9	11	3	11	18	14	7	3	11	15	12	121
			Uninsured	15	15	15	15	15	15	15	15	15	18	15	15	183
	Substantial Rehabilitation	HUD	FHA	10	2	3	4	17	13	3	6	8	12	7	11	96
		SHFA	FHA	4	1	1	0	0	2	3	2	2	1	2	2	20
			Uninsured	4	2	4	6	3	4	1	1	6	1	4	4	40
Low Income Public Housing			Turnkey	13	13	13	8	13	6	13	3	13	2	13	8	118
			Conventional	15	7	15	4	15	9	15	1	15	6	15	3	120
Section 236 Rent Supplement (HUD Processed)				25	1	11	2	25	0	24	2	25	1	29	25	170
Section 221(d)4 (Unsubsidized)				30	14	1	0	42	30	5	1	32	30	3	2	190
TOTAL				139	81	89	72	156	115	111	82	134	103	131	162	1,375

[a]For new construction, HUD processed projects, only 221(d)4 (or d3) projects are included, although the universe of all such projects in Table 3-1 contains a small number of other FHA program types. For other Section 8 FHA-insured projects, the sample includes a few other FHA program variants.

[b]Sample restricted to nine SHFAs: (1) California; (2) Maryland; (3) Massachusetts; (4) Minnesota; (5) Oregon; (6) Pennsylvania; (7) Tennessee; (8) Vermont; (9) Virginia; and (10) Wisconsin.

(3) SHFA-processed, insured new construction; (4) HUD-processed, insured substantial rehabilitation; and (5) SHFA-processed, insured substantial rehabilitation.[11] In other instances, the size of the sample for each program/ financing variant was designed to insure estimates of average development costs with confidence intervals of roughly 95 percent or better.[12]

Given the desired sample size for each program/financing variant, projects were then distributed in roughly equal numbers across the 12 cells defined by tenant type, size, and age. For Public Housing and FHA projects, projects within a given cell were selected on a random basis, without regard to location. However, for uninsured SHFA projects, we restricted the sample to a subset of nine SHFAs: (1) California; (2) Maryland; (3) Massachusetts; (4) Minnesota; (5) Oregon; (6) Pennsylvania; (7) Tennessee; (8) Virginia; and (9) Wisconsin.[13] Limiting the sample in this manner reflected the need to reduce data collection costs, since information on such projects had to be collected through on-site visits.

The impact of this restriction is depicted in Table 3-5, which divides the universe of SHFAs into eight different groups based on region and uninsured Section 8 activity. The nine SHFAs included in the analysis are indicated by asterisks. As

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[11]The actual number of observations in the sample is typically somewhat smaller than the universe, since we had to exclude projects without an FHA ID. This ID was necessary to collect the data in HUD's Central Office, and thus was a key prerequisite in the data collection effort.

[12]In order to increase our probability of collecting a large body of data, we over-sampled across the board by roughly 20 percent.

[13]USR&E field staff also collected data from the Vermont SHFA. However, since that agency did not require certified costs until fairly recently, Vermont projects were subsequently excluded from the analysis.

Table 3-5

CHARACTERISTICS OF SHFAs
(Parentheses Signify Number of Uninsured, Bond-Financed Projects Completed Between 1975 and 1979)

	Large	Small
NORTHEAST	Maine (80) * Pennsylvania (43) * Massachusetts (40) Rhode Island (30) New Jersey (29)	Vermont (21) Connecticut (8) New York (16) New Hampshire (4) Delaware (5)
NORTH CENTRAL	* Minnesota (100) * Wisconsin (59) Illinois (41) Michigan (38)	Ohio (1)
SOUTH	* Virginia (39)	* Maryland (13) * Tennessee (10) Kentucky (8) South Carolina (1)
WEST	* Oregon (48)	* California (21) South Dakota (21) Idaho (19) Colorado (1)

*Selected for sample.

the table readily illustrates, the SHFAs included in the sample constitute a fairly representative mix of all such agencies during the study period. The coverage is particularly good with respect to new construction; combined, the nine agencies developed some 340 newly constructed, uninsured projects -- or about 56 percent of the relevant universe. However, the coverage of uninsured rehabilitation projects is less desirable. While the nine agencies produced about 40 percent of all such projects, the sample is small and more than half of the observations were located in Massachusetts; as a result, findings for this program variant should be viewed with caution.

The Actual Sample

Previous tables described the sample of projects that were originally selected for analysis. Table 3-6 describes the sample that was actually used.[14] Differences between the original and actual samples reflect two different factors, the most important of which was an inability to locate the requisite cost and attribute forms. Some additional deletions were made based on the reasonableness of reported figures and the availability of data used for cost deflation purposes.

In all, we collected acceptable information on some 828 projects, or about 60 percent of our original sample. Completion rates differed across the different program/financing variants, ranging from a low of about 45 percent for Public Housing and 236 projects, to a high of about 75 percent for newly constructed FHA projects and uninsured SHFAs. The actual sample accounted for about 21 percent of the overall universe. For the larger program/financing variants, we achieved final sampling ratios that were between 18 and 22 percent; however,

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[14]All projects included in the actual sample have both cost and attribute data. However, about half of these projects do not have developer surveys. For further details on the data collection efforts, see Appendix A.

Table 3-6

OVERVIEW OF DATA COLLECTION EFFORTS

	Universe of Projects	Attempted Sample	Actual Sample		
	Number	Number	Number	% of Attempts	% of Universe
SECTION 8					
NEW CONSTRUCTION					
202	123	107	58	54 %	47 %
HUD FHA	740	181	135	75	18
11(b) Insured	35	29	19	66	54
SHFA FHA	125	121	78	64	62
SHFA Uninsured	605	183	132	72	22
SUBSTANTIAL REHABILITATION					
HUD FHA	98	96	56	58	57
SHFA FHA	23	20	13	65	57
SHFA Uninsured	93	40	19	48	20
PUBLIC HOUSING					
Turnkey	351	118	55	47	16
Conventional	274	120	53	44	19
236 RENT SUPPLEMENT	870	170	77	45	9
UNSUBSIDIZED 221(d)4	685	190	133	70	19
TOTAL	4,022	1,375	828	60 %	21 %

for the smaller programs (where we initially sampled at a higher rate), our coverage ranged from about 50 to 60 percent.

Table 3-7 presents additional information on the characteristics of the final sample. (Further breakdown by the individual cells used in the sampling framework are presented in Appendix G.) As the table readily illustrates, the sample contains a relatively rich mix of different project types, in terms of size, tenant population, and year of development. This diversity in project types, combined with the fairly intensive sampling rates, should enable us to achieve reasonably accurate estimates of inter-program differences in development costs. However, one should note that the samples of 11(b) and uninsured SHFA rehabilitation projects are extremely small. As a result, findings for these two program variants must be interpreted with caution.

Table 3-7

CHARACTERISTICS OF THE ACTUAL SAMPLE

	Universe of Projects		Actual Sample	
	Number	Proportion	Number	Proportion
CONSTRUCTION TYPE				
New	3,808	95 %	740	89 %
Sub Rehab	214	5	88	11
PROJECT TYPE				
Family/Mixed	2,561	64 %	445	54 %
Elderly	1,461	36	383	46
PROJECT SIZE				
5 to 49	1,074	27 %	194	23 %
50 to 99	1,301	32	288	35
100 or more	1,647	41	346	42
COMPLETION DATE				
1975 to 1978	2,820	70 %	501	61 %
1979	1,202	30	327	39
TOTAL	4,022	N/A	828	N/A

Chapter 4

DESCRIPTIVE ANALYSIS OF PROJECT DEVELOPMENT COSTS AND CHARACTERISTICS

In this chapter we address three major research issues:

- What are the average costs of various types of subsidized and unsubsidized housing projects?
- How do these average costs and their major components vary under the different programs, financing mechanisms and sponsor types?
- How do the characteristics of projects differ under the various program types in terms of project attributes, location, developer characteristics and length of the development period?

To provide insight into the nature and magnitude of systematic differences across the different program types, all data in this chapter have been weighted to obtain estimates of population (as opposed to sample) means.[1] We begin by presenting components of costs in two different ways: (1) dollar amount per unit; and (2) dollar amount per square foot of gross space.[2] All costs have been adjusted for construction price variations across cities and over time, using the methodology described in Chapter 3.[3] Standard

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[1] Appendix C presents all data in unweighted form. Appendix G shows the weights used in the current analysis.

[2] Appendix E presents data on average costs per project.

[3] Appendix B presents all cost data in current, i.e., unadjusted, dollars.

means from the overall sample average.[4] The remainder of the variance is explained by intra-program differences.

When eta^2 is high, most of the sample variance can be attributed to program type; when it is low, differences across the programs are relatively unimportant. For example, the tables presented in Appendix E show that total project costs have an eta^2 of .02. This figure implies that only about two percent of the variation in project costs are due to differences in the average level of expenditures observed for the different programs. Viewed alternatively, about 98 percent of the sample variance reflects differences that occur within each program type.

4.1.1 Unit Development Costs

Table 4-1 presents average development costs, expressed on a per unit basis.[5] For the majority of program variants, these costs are broken down into eight major categories, including: (1) improvements; (2) land; (3) off-site costs; (4) construction period carrying charges; (5) program financing and filing fees; (6) legal, organizational, and audit cost; (7) other miscellaneous items; and (8) profit. As noted in Chapter 3, comparable breakdowns for Public Housing were not available In particular, PHA expenditures on Administration and Planning had to be combined into one general category that is roughly comparable to the various financing fees and profit allowances recorded under FHA.

In our analysis of development costs, we also make a distinction between the "hard" and "soft" components of a

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[4]Eta^2 is equivalent to the statistic R^2, produced by a regression of the variable on a series of dummy variables signifying program type.

[5]Information on number of units was obtained from FHA Form 2013 and similar forms for SHFA non-insured projects. For PHA projects, the number of units was obtained from the cost forms.

Table 4-1

PER UNIT DEVELOPMENT COSTS:
1980 Dollars Adjusted for Regional Differences in Costs[1,2]
(Weighted)

COMPONENTS OF COSTS	UNSUBSIDIZED	SUBSIDIZED											
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING		
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION		
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional	eta[2]
Total Improvements[a]	$21,934	$24,732	$28,333	$23,146	$24,217	$23,950	$24,737	$20,211	$20,643	$29,578	$35,430	$34,737	.312
Land[a]	1,635	1,347	1,303	1,739	1,344	1,668	1,864	4,207	3,642	2,127	2,921	3,735	.174
Off-Site Costs[b]	152	133	167	84	34	178	31	35	33	0	N/A	N/A	.035
Construction Period Carrying Charges (Interest, Insurance, Taxes)[a]	1,445	1,661	1,490	1,284	1,277	1,246	1,230	1,904	1,814	1,597	1,256	1,375	.046
Program Financing & Filing Fees[a]	1,928	1,693	120	2,000	1,745	1,885	789	1,978	1,995	711			.570
Legal, Organizational & Audit[a]	194	317	255	211	169	185	144	272	335	593	1,280	1,604	.109
Other Costs[a]	165	236	893	147	159	185	273	350	330	310			.177
Profit[a]	2,475	2,356	976	2,637	2,760	2,579	1,751	2,411	2,190	2,566			.205
TOTAL COSTS[a]	29,928	32,474	33,537	31,248	31,705	31,876	30,818	31,368	30,982	37,482	40,887	41,451	.181
Sample Size	133	77	58	135	19	78	132	56	13	19	55	53	

[1]The level of significance at which F tests reject the hypothesis of equal means across program types is indicated as follows:
a = .001; b = .01; c = .05; d = .1.

[2]eta[2] indicates the proportion of variance explained by program type.

project's costs. Hard costs include all items associated with the "bricks and mortar" expenses of constructing the project and the market value of the land. These costs are contained in the first three line items in Table 4-1, and include improvements, off-site expenditures, and land. The remaining items in the chart fall into the "soft" component of development costs, and include carrying charges, programmatic processing and financing fees, and developer's profit. On average, the soft cost components represents about 20 percent of total costs.

Improvement Costs. In general, subsidized new construction tends to have higher unit improvement costs than unsubsidized FHA. The differences are fairly modest for Section 236 and HUD- and SHFA-processed Section 8; such projects have average improvement costs that range from between $23,000 to $25,000 per unit, compared to an average of $22,000 for unsubsidized FHA. These differences result in differentials vis-a-vis unsubsidized FHA of 5 to 14 percent.

The other new construction variants exhibit average improvement costs that range from about $28,000 to $35,000 per unit. Section 202/8 units are about 20 percent more expensive than the average HUD- and SHFA-processed Section 8 unit, and about 27 percent more expensive than unsubsidized FHA. Such markups may in part reflect the special design requirements associated with the elderly and handicapped tenants that are served by this program type. However, by far the largest differentials are observed for Public Housing. With per unit improvement costs that average about $35,000, Public Housing is about 46 percent more expensive than Section 8 new construction, and almost 60 percent more expensive than unsubsidized FHA.

Chapter 3 described the problems that arise in comparing the improvement costs of Public Housing with the other program variants. In particular, the "bricks and mortar" expenditures in Public Housing are likely to contain a certain amount of

"soft" development charges, including a builder's fee for Conventional units and, for some Turnkey projects, the developer's carrying charges. In the regression analysis in Chapter 5, we attempt to correct for these factors statistically. However, even in the absence of such adjustments, the very size of the differential for both Turnkey and Conventional units suggests that potential biases in the Public Housing data account for only a small proportion of their higher improvement costs.

In contrast to new construction, most forms of subsidized substantial rehabilitation have average improvement costs of about $20,000 to $21,000, which is about 8 percent below the average costs of unsubsidized FHA. The major exception to this pattern is uninsured SHFA-processed substantial rehabilitation, which had average costs of almost $30,000 per unit. Such costs exceed those of other kinds of renovation by approximately 44 percent, and are about 36 percent higher than the average cost of unsubsidized FHA.

Land. Among new construction programs, per unit land costs for Public Housing, particularly for Conventional projects, are substantially higher than those for the other new construction programs. In particular, Public Housing had average land costs of about $3,000 to $3,700 per unit, compared to averages of $1,300 to $1,800 for the other new construction variants. As we shall see in a subsequent section, much of this difference can be attributed to the fact that the average Public Housing project has almost twice as much land per unit as the average project developed under unsubsidized FHA (Table 4-4). At the other extreme, Section 236, Section 202/8 and 11(b) had the lowest per unit land values. The costs of land incurred by the remaining Section 8 variants are fairly similar, and resemble per unit land costs of unsubsidized housing.

Land costs for substantial rehabilitation--which include the value of the unimproved shell--are typically about two to

three times as high as the value of land in new construction. FHA program variants have average land costs in the $3,600 to $4,200 range. However, values of non-FHA rehabilitation are considerably lower, at only about $2,100 per dwelling unit.[6] The lower land costs of such projects--combined with their higher improvement costs--reflects a predominance of "gut rehab" within this program type.

Total Hard Development Costs. Combining the first three components of development costs--land, off-site costs, and improvements--does little to alter the relative ranking of newly constructed projects that was observed for improvement costs. Total "hard" costs range from about $24,000 for unsubsidized FHA units to about $38,000 for Public Housing. The major differences occur in the relative costs of substantial rehabilitation. In particular, when the value of the property is combined with improvements, the hard costs of FHA insured substantial rehabilitation are virtually identical to the costs of newly constructed unsubsidized FHA units. However, the hard costs of SHFA uninsured units exceed the cost of unsubsidized FHA by almost 34 percent.

The comparable costs of newly constructed and rehabilitated units flies in the face of conventional wisdom regarding the higher costs of substantial rehabilitation. Some insight on this issue can be gained by examining project costs that have been adjusted for time, but not for place. These data, which are presented in Appendix M, indicate that the unit costs of HUD-processed Section 8 substantial rehabilitation are about 11 percent higher than the unit costs of Section 8 new construction. In this instance, the apparently higher costs of rehabilitation can be attributed to the fact that they are

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[6]To some extent, the low average land cost for state non-insured projects may also reflect the practice by the Massachusetts SHFA to allow only the original purchase price of the property as a mortgagable item. Since the Massachusetts projects constitute about half of the observations for this program type, costs could be biased downward.

located in high cost areas. As was shown in Table 4-1, when costs are adjusted for regional differences in factor prices, such markups disappear.

Soft Development Costs. The remaining components of development costs reflect a project's "soft" development costs, and include carrying charges, financing fees, and builder or sponsor profit. Since such costs are typically based on expenditures for land and improvements, it is perhaps more relevant to examine these items as a percentage of total cost. Such breakdowns are presented in Table 4-2.

Except for Public Housing, carrying charges for newly constructed projects tend to be around four to five percent of total costs. For Public Housing, they average about three percent. For conventional units, this lower rate undoubtedly reflects the more favorable financing items available through tax exempt financing; however, for Turnkey units--which receive financing on the private market--it probably reflects problems in allocating costs to their proper category[7]. Not surprisingly, carrying charges for rehabilitation projects tend to be a larger proportion of development cost. This reflects the higher insurance costs and property taxes associated with the value of the original structure.

Program financing and filing fees are less than one percent of total costs for Section 202/8 projects, about 2 percent for SHFA-uninsured projecss, and about 5.5 to 6.5 percent for FHA-insured projects. The absence of intra-program variation in this cost component is evident from the value of eta^2; more than 73 percent of the variance is explained by inter-program differences. Legal, organizational and audit costs are a relatively small component of costs for all program types, and typically account for about one percent or less of total costs.

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[7]See Chapter 3 for a discussion of this issue.

Table 4-2

DEVELOPMENT COST COMPONENTS AS A PROPORTION
OF TOTAL DEVELOPMENT COST[1,2]
(Weighted)

COMPONENTS OF COSTS	UNSUBSIDIZED	SUBSIDIZED											
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING		
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION		
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional	eta[2]
Total Improvements[a]	73.3 %	76.1 %	84.4 %	74.1 %	76.6 %	75.0 %	80.3 %	61.3 %	64.9 %	75.7 %	86.6 %	84.2 %	.445
Land[a]	5.4	4.3	3.9	5.5	4.1	5.6	6.7	16.9	13.7	8.7	7.2	8.8	.187
Off-Site Costs[a]	0.5	0.4	0.5	0.3	0.1	0.6	0.1	0.1	0.1	0.0	N/A	N/A	.049
Construction Period Carrying Charges (Interest, Insurance, Taxes)[a]	4.8	5.1	4.4	4.1	4.0	3.8	3.9	6.1	5.8	5.2	3.0	3.2	.107
Program Financing & Filing Fees[a]	6.5	5.2	0.3	6.4	5.4	5.8	2.5	6.5	6.4	2.0			.731
Legal, Organizational & Audit[a]	0.7	1.0	0.8	0.7	0.6	0.6	0.5	0.9	1.1	1.4	3.3	3.9	.082
Other Costs[a]	0.5	0.7	2.7	0.5	0.6	0.6	0.8	1.0	1.2	0.7			.182
Profit[a]	8.3	7.2	3.0	8.4	8.7	8.0	5.2	7.4	6.8	6.3			.239
TOTAL COSTS	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	N/A
Sample Size	133	77	58	135	19	78	131	56	13	19	55	53	

[1]The level of significance at which F tests reject the hypothesis of equal means across program types is indicated as follows:
a = .001; b = .01; c = .05; d = .1.

[2]eta[2] indicates the proportion of variance explained by program type.

Variations in the importance of the profit component reflect the frequency of non-profit developers, as well as the fact that profit is calculated on improvements and soft costs, exclusive of land. Almost all of the developers of HUD-processed Section 8 and unsubsidized FHA were for-profit organizations, compared to only about 80 percent for Section 236 and uninsured SHFA. The greater frequency of non-profit developers among the latter two program variants is reflected in their relatively low profit rates, which range from an average of five to seven percent. The non-profit status of Section 202/8 developers is also evident from the chart, with an average profit of three percent reflecting the builders' fees. Finally, the relatively low profit rates for substanial rehabilitation projects are at least partly due to the prominence of land as a portion of total costs; when profits are computed as a percentage of total costs excluding land, the rates for substantial rehabilitation projects become much more similar to those for new construction.

If one combines the various "soft" components of development costs, several striking patterns emerge. To begin with, most FHA program variants have soft costs that account for about 20 to 22 percent of a project's total development costs. However, the remaining program variants have costs that are considerably lower. For SHFA-uninsured projects, a project's soft costs average about 13 to 15 percent of total costs; for Section Section 202/8, about 11 percent, and for Public Housing, about six to seven percent. As we have seen, these lower soft costs reflect a variety of factors, including a greater reliance on non-profit sponsors, more favorable short-term financing, and lower program-related administrative and financing fees.

Total Development Cost. Inter-program differences in total development cost per unit are more moderate than the differences in construction costs, due to a tendency for soft costs to be relatively low for the program variants with the highest improvement costs. The least expensive units are unsubsidized FHA, with average costs just under $30,000. Most

of the subsidized programs, including the rehabilitation variants, tend to develop projects with average costs of $31,000 to $32,000 per unit. However, units developed under Section 202/8, SHFA-uninsured rehabilitation and Public Housing and significantly more expensive, although the differences are less dramatic than those in improvement costs. In general, Section 202/8 units are about 12 percent more expensive than unsubsidized FHA; SHFA non-insured rehabilitation units, about 25 percent more; and Public Housing units, about 37 percent more.

4.1.2 Costs Per Gross Square Foot of Space

Another common way of comparing development costs is on a square foot, as opposed to unit basis. Such data is presented in Table 4-3, where "space" is defined to include residential, commercial, and common areas. In general, translating costs from a unit to square foot basis tends to increase the cost differentials that arise across the different program types. For example, the relatively high eta^2 for square foot improvement costs suggests that almost half of the sample variance is explained by systematic program differences. This value is considerably higher than the eta^2 that was associated with unit improvement costs (.312).

Differences in patterns of "unit" and "square foot" costs arise from two basic factors. To begin with, variations in the size of units under the different program types may change their relative rankings when viewed from the perspective of "square foot" costs. For example, if two units cost the same amount to develop, the larger unit will have lower costs when translated to a "square foot" basis. Variations in the amount of non-residential space contained in projects may also produce distinctly different patterns in "unit" and "square foot" costs. In general, costs per unit will be relatively high when there is a large amount of non-residential space, since the cost of such space will be included in the cost of the dwelling

Table 4-3

DEVELOPMENT COSTS PER SQUARE FOOT OF GROSS SPACE:
1980 Dollars Adjusted for Regional Differences in Costs[1,2]
(Weighted)

COMPONENTS OF COSTS	UNSUBSIDIZED	SUBSIDIZED											
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING		
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION		
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional	eta[2]
Total Improvements[a]	$ 23.38	$ 27.39	$ 37.03	$ 28.71	$ 28.63	$ 30.57	$ 29.84	$ 21.93	$ 21.44	$ 27.07	$ 48.45	$ 41.37	.455
Land[a]	1.74	1.54	1.73	2.13	1.53	2.21	1.98	4.61	3.47	2.06	3.72	4.96	.150
Off-Site Costs[c]	0.16	0.16	0.22	0.11	0.04	0.23	0.04	0.04	0.07	0.00	N/A	N/A	.031
Construction Period Carrying Charges (Interest, Insurance, Taxes)[a]	1.52	1.83	1.89	1.60	1.52	1.58	1.56	2.01	1.79	1.48	0.95	1.63	.050
Program Financing & Filing Fees[a]	2.06	1.87	0.16	2.47	2.12	2.39	0.98	2.15	1.99	0.69			.580
Legal, Organizational & Audit[c]	0.21	0.33	0.36	0.26	0.20	0.24	0.18	0.28	0.42	0.51	1.65	1.84	.074
Other Costs[a]	0.17	0.24	1.20	0.19	0.18	0.24	0.35	0.37	0.67	0.28			.223
Profit[a]	2.63	2.64	1.30	3.27	3.27	3.27	2.27	2.64	2.02	2.32			.250
TOTAL COSTS[a]	31.87	36.01	43.89	38.74	37.48	40.72	37.20	34.05	31.86	34.41	54.77	49.80	.310
Sample Size	123	75	56	131	19	78	100	45	7	19	28	32	

[1]The level of significance at which F tests reject the hypothesis of equal means across program types is indicated as follows:
a = .001; b = .01; c = .05; d = .1.

[2]eta[2] indicates the proportion of variance explained by program type.

unit. However, these same projects may have relatively low square foot costs, since non-residential space is typically less expensive to develop.

Improvement Costs. Expressing improvement costs on a square foot basis generally increases the percentage cost differential between subsidized and unsubsidized dwelling units. Unsubsidized FHFA is again the cheapest new construction variant, with improvement costs of about $23 per square foot. The remaining program variants have average improvement costs that range from about $27 to $48 per square foot, producing differentials of 17 to 100 percent. These percentage differentials are considerably higher than the markups observed in per unit improvement costs, which ranged from 5 to 59 percent.

As will be described more fully in a subsequent section, these increased cost differentials vis-a-vis unit costs can be attributed in part to systematic differences in unit size. In general, unsubsidized FHA units are considerably larger than those developed under Section 8 and Public Housing. For example, the average unsubsidized unit had about 821 square feet of space, compared to 539 square feet for Section 202/8, about 670 square feet for other forms of Section 8, and about 700 to 750 square feet for Public Housing. In addition, unsubsidized FHA projects have a relatively high proportion of non-residential space. The average unsubsidized project was about 90 percent residential, compared to about 70 to 85 percent residential for the subsidized program variants.

Translating costs on a square foot basis also tends to intensify differences in the relative costs of the various subsidized program types. For example, unit costs for Section 202/8 were about 22 percent higher than other kinds of Section 8 new construction, while square foot costs displayed a 29 percent differential. The greater spread in square foot costs reflects the smaller size of Section 202/8 units (539 sq.ft.) when compared to other types of Section 8 (660 to 680 sq.ft.). This size difference dominated any off-setting impact on

relative costs associated with the relatively high proportion of non-residential space observed in Section 202/8 (70 percent).

Expressing costs on a square foot basis also increases the gap between Section 8 New Construction and Section 8 Substantial Rehabilitation. HUD-processed rehabilitation had unit improvment costs that were about 12 percent lower than the unit costs of HUD-processed new construction, while the differential in square foot costs were 24 percent. Since unit sizes were fairly comparable in the two program types, this shift primarily reflects the lower proportion of residential space in rehabilitated projects (70 versus 80 percent). The costs of uninsured SHFA rehab projects have also become more comparable to the other kinds of substantial rehabilitation. This shift is primarily due to the fact that the units developed by this program variant are about 12 percent larger than units developed under the other rehabilitation variants.

Finally, expressing costs on a square foot basis produces a gap in the relative costs of Turnkey and Conventional Public Housing. Although the unit costs of these two program variants are virtually identical, the square foot costs of Turnkey units are some 17 percent higher than the costs of Conventional Public Housing. Since Turnkey and Conventional units have about the same proportion of non-residential space, the differential that arises with respect to square foot costs is entirely due to the larger units developed under the conventional program.

Total Development Costs. Following the patterns in improvement costs, bottom line costs for unsubsidized projects tend to be, at $32 per square foot, 22 percent lower than those for the average FHA subsidized new projects, which vary between a low of $36 for Section 236 projects to almost $41 for SHFA insured projects. Section 202/8 projects remain the most expensive among new Section 8 programs at almost $44 per square foot. Substantial rehabilitation projects, even after adding the value of the shell, remain somewhat cheaper than new con-

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struction. Interestingly, controlling for gross floor space has caused SHFA non-insured project costs to become remarkably similar to HUD-insured projects, as opposed to the 20 percent difference which existed on a cost per unit basis.[8]

Finally, in spite of the fairly low soft costs associated with Public Housing, high improvement and land costs cause total per square foot costs to be dramatically higher than costs in the private sector. The difference for Turnkey projects, at almost 72 percent, is particularly striking. Turnkey projects' bottom line costs also continue to exceed those of Conventional projects, although the difference is somewhat mitigated by the relatively lower soft costs and land costs associated with Turnkey projects.

4.2 Descriptive Analysis of Project Characteristics

The above analysis showed substantial variation in development costs across the different program types. This section examines variations in project characteristics in order to determine the extent to which programs vary in the units that they produce. Structural characteristics, location and sponsor characteristics are examined in turn.

4.2.1 Structural Characteristics[9]

Standard analysis of variance techniques were generally used to determine the extent to which variations are due to inter-program differences. However, such techniques are inappropriate for discrete variables such as "exterior finish." For such variables crosstabs were performed which

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[8]Note, that this is not land costs per square foot of land.

[9]Most of the data in this section were obtained from FHA Form 2013 and the corresponding state forms. However, "percent elderly" was obtained from Section 8 MIS, MIDLIS or FORMS data tapes, while "scattered site" was obtained from the developers' survey. For Public Housing all data (except "percent elderly") were obtained from PHA surveys.

utilize Chi Square tests to identify significant variations among programs. The results are presented in Table 4-4.

Project Size. The rather low eta^2 in the number of units per project suggests that only about seven percent of the sample variance can be attributed to program type, and that most of the variation occurs within the different programs. Nevertheless, the largest projects appear to be developed under unsubsidized FHA, Section 236, and SHFA insured rehabilitation with an average number of units of 115, 119, and 147 units, respectively. In contrast, the state uninsured programs tended to develop smaller projects, with an average of 70 units. The remaining program variants fall between these two extremes.

Unit Size. Our examination of square foot costs has already referenced differences in the average size of units developed under the different program types. In general, unsubsidized units tend to be almost 150 square feet larger on average than those developed under most subsidized programs. Among all non-PHA subsidized programs, Section 236 and SHFA non-insured substantial rehabilition units tend to be largest, while, not surprisingly, Section 202/8 units are smallest. Not much variation exists among the rest of the Section 8 variants, which all tend to produce units between 650 and 680 square feet. Public Housing units are generally somewhat larger than most Section 8 units, a tendency which is particularly pronounced for Conventional Public Housing units, which are almost 100 square feet bigger on average than the average Section 8 unit.

Since average unit size would vary with the number of bedrooms and baths in a unit, it is interesting to examine the extent to which unit size differentials are due to the number of rooms versus larger sizes of the rooms. The data in Table 4-4 show that most Section 8 program variants produce units with an average of around 1.4 bedrooms and 1 bath. The exceptions are Section 202/8 projects which consist almost entirely of one bedroom units. Due to substantial proportions of two and three or more bedroom units, the Section 236 program

Table 4-4

STRUCTURAL CHARACTERISTICS OF PROJECTS[1,2]
(Weighted)

TYPE OF CHARACTERISTIC	UNSUBSIDIZED	SUBSIDIZED											
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING		
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION		
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional	eta[2]
PROJECT SIZE													
Number of Units[a]	115	119	97	86	101	93	74	106	147	69	73	83	.068
Unit Size (Square Feet)[a]	821	787	539	664	679	653	676	663	606	745	697	755	.202
Percent Residential	87.3%	85.6%	69.9%	80.5%	77.7%	83.1%	76.6%	67.9%	69.0%	67.0%	83.8%	84.4%	.241
BEDROOMS													
a. Average Number per Unit[a]	1.7	1.9	1.0	1.4	1.5	1.4	1.4	1.6	1.3	1.4	1.5	1.6	.140
b. Composition of Average Project Efficiency[a]	1.8 %	5.1 %	5.9 %	0.9 %	0.0 %	0.0 %	1.3 %	9.0 %	11.6 %	4.0 %	12.0 %	15.7 %	.097
1 Bedroom[a]	35.8	25.7	91.9	70.0	71.3	70.0	72.1	44.5	53.0	65.1	46.7	45.2	.269
2 Bedrooms[a]	54.8	42.6	2.2	18.8	13.3	21.4	16.6	30.5	25.4	22.3	22.1	14.3	.310
3 or more Bedrooms	7.6	26.6	0.0	10.3	15.5	8.5	10.1	16.0	9.9	8.8	19.3	24.8	
BATHS													
a. Average Number per Unit[a]	1.2	1.1	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	.163
b. Composition of Average Project Half Bathroom[a]	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	1.5 %	0.0 %	.062
1 Bathroom[a]	69.7	82.6	99.9	90.1	87.4	92.2	95.4	92.9	96.8	96.2	92.4	88.1	.155
1.5 Bathrooms[a]	17.1	15.3	0.0	7.1	5.1	7.4	3.2	5.7	3.2	2.2	2.2	5.5	.084
2 or more Bathrooms	13.1	2.1	0.1	2.7	7.5	0.5	1.3	1.4	0.0	1.6	3.8	6.3	
PROJECT AMENITIES													
Air Conditioning[a]	89.3 %	54.3 %	66.0 %	75.4 %	50.3 %	88.3 %	54.4 %	53.5 %	35.0 %	75.8 %	51.8 %	20.9 %	N/A
Laundry Facilities[a]	94.2	88.6	86.6	87.4	60.3	85.1	91.9	79.0	60.0	57.4	81.5	45.3	N/A
Dish Washers	93.9	2.7	6.5	10.2	22.2	7.4	9.1	9.4	10.0	43.6	3.0	0.0	N/A
Drapes[a]	75.9	32.2	70.6	54.8	59.7	41.3	48.3	33.3	30.0	29.2	27.9	18.3	N/A
Refrigerators[a]	100.0	99.7	98.5	99.3	100.0	98.9	94.3	100.0	100.0	87.7	100.0	98.8	N/A
Disposal[a]	92.4	53.8	51.9	65.8	36.2	51.4	56.8	37.7	25.0	57.4	13.7	6.1	N/A
Kitchen Exhaust Fans[a]	96.9	82.9	95.3	92.4	96.0	95.5	90.3	48.0	50.0	88.0	84.4	72.2	N/A
Carpets[a]	98.0	47.9	91.1	84.4	67.8	73.8	71.7	51.0	30.0	77.4	37.5	14.0	N/A

[1]The level of significance at which F tests or Chi Square tests reject the hypothesis of equal means or distributions across program types is indicated as follows:

a = .001; b = .01; c = .05; d = .1.

[2]eta[2] indicates the proportion of variance explained by program type.

Table 4-4 (Continued)

TYPE OF CHARACTERISTIC	UNSUBSIDIZED	SUBSIDIZED										
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING		
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION		
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional	eta[2]
PROJECT AMENITIES (Continued)													
Recreation Rooms	45.0	30.2	44.1	61.1	79.3	57.3	63.0	29.1	55.0	43.3	83.1	62.4	N/A
Intercoms	0.0	0.3	1.8	0.0	0.0	0.0	41.6	0.0	0.0	5.9	16.7	16.3	N/A
Balconies	2.6	0.0	0.0	2.6	0.0	0.0	19.1	0.0	0.0	4.8	19.2	15.3	N/A
Tennis Courts	35.5	0.0	2.1	2.6	0.0	3.4	2.4	3.8	0.0	0.0	0.0	5.7	N/A
Swimming Pool	64.9	7.9	0.0	4.3	8.0	4.6	3.2	4.7	0.0	0.0	0.0	0.0	N/A
Playground	28.5	15.2	11.0	51.8	71.8	49.7	51.8	7.2	25.0	27.5	47.0	43.9	N/A
DENSITY													
Lotsize Per Unit[a] (Square Feet)	2,808	2,771	2,562	2,871	2,625	3,090	2,695	946	1,333	1,244	3,467	6,992	.169
Number of Stories[a]	2.28	3.49	4.41	2.98	3.94	3.04	3.09	5.47	5.42	4.35	3.28	3.10	.080
STRUCTURE TYPE													
Semi-attached or Detached[a]	5.8 %	3.7 %	8.0 %	9.5 %	3.5 %	17.3 %	10.5 %	1.8 %	0.0 %	0.0 %	22.0 %	39.4 %	N/A
Row[b]	8.5	3.7	6.8	11.2	18.2	13.7	20.1	3.8	0.0	0.0	13.7	17.5	N/A
Walk-Up[a]	64.7	13.4	5.4	17.1	19.4	18.0	7.9	16.2	0.0	15.5	1.3	5.5	N/A
Elevator[a]	7.5	7.0	72.8	43.0	35.6	26.8	38.7	64.0	75.0	35.5	35.9	20.5	N/A
Mixed	13.4	72.1	7.0	19.3	23.3	24.2	22.8	14.3	25.0	49.0	27.1	17.2	N/A
EXTERIOR FINISH													
Durable[a]	12.4 %	28.4 %	38.7 %	37.6 %	34.7 %	42.6 %	35.1 %	77.4 %	76.9 %	82.7 %	39.6 %	43.7 %	N/A
Mixed Durable[a]	30.8	35.8	28.6	32.2	36.2	38.2	17.2	11.0	15.4	17.3	18.3	43.7	N/A
Wood[a]	27.9	26.1	15.3	11.2	21.7	14.4	39.4	2.1	0.0	0.0	16.0	2.7	N/A
Stucco[a]	8.8	3.4	8.3	7.1	0.0	0.0	0.0	4.2	0.0	0.0	6.2	1.5	N/A
Manufactured[a]	2.8	0.0	1.8	0.0	7.5	1.1	2.7	0.0	0.0	0.0	3.4	0.0	N/A
Other[a]	17.4	6.2	7.3	11.9	0.0	3.7	5.5	5.4	7.7	0.0	16.5	8.5	N/A
SCATTERED SITE[c]	19.6 %	13.3 %	16.2 %	4.3 %	18.9 %	4.7 %	18.7 %	15.9 %	0.0 %	30.7 %	25.2 %	27.6 %	N/A
PERCENT ELDERLY[a]	1.2 %	12.2 %	96.7 %	60.2 %	63.3 %	52.8 %	58.0 %	40.7 %	45.0 %	38.4 %	36.7 %	32.2 %	N/A
Sample Size[3]	132	77	58	132	19	78	132	54	13	19	41	40	

[1]The level of significance at which F tests or Chi Square tests reject the hypothesis of equal means or distributions across program types is indicated as follows:

a = .001; b = .01; c = .05; d = .1.

[2]eta[2] indicates the proportion of variance explained by program type.

[3]Sample Sizes refer to the number of observations available on project amenities.

has the largest number of bedrooms per unit (1.9), exceeding even the relatively large unsubsidized projects. The latter two project types also tend to have more units with more than one bath. Public Housing projects resemble Section 8 projects in terms of average number of bedrooms. However, they tend to have larger concentrations of both efficiency and three or more bedroom units. Hence they seem to serve very small and very large households somewhat better.

Varying proportions of units with large numbers of bedrooms explain the above observations on floor space differences to some degree. Table 4-5 provides further insight into the extent to which units with the same number of bedrooms vary in terms of floor space among the various program variants.[10] There is some evidence that unsubsidized units tend to be systematically bigger than subsidized units even after controlling for number of bedrooms. Among subsidized new construction, variations in unit size appear rather small, although perhaps units with 3 or more bedrooms produced by the SHFA uninsured program variant tend to be somewhat larger than most. Insured substantial rehabilitation units are fairly similar in size to newly constructed Section 8 units, but, again, the SHFA uninsured substantial rehabilitation units appear larger. Public Housing units generally are comparable in size to Section 8 units, although some bedroom types (efficiency, one-bedroom and four-bedroom units) produced under Conventional Public Housing tend to be relatively large.

It is interesting to compare what has actually been produced by subsidized housing programs with two sets of HUD standards. One set, referred to as "HUD Maximum" in Table 4-5,

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[10]One must keep in mind that sample sizes become rather small at this level of stratification, causing larger standard errors. Therefore the confidence with which one can make statements about the population means based on our sample diminishes.

Table 4-5

COMPARISON OF AVERAGE UNIT SIZE IN NET RESIDENTIAL SQUARE FEET
ACTUAL VERSUS HUD STANDARDS
(Weighted)

BEDROOM TYPE	HUD STANDARDS		UNSUBSIDIZED	SUBSIDIZED										
			221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING	
	HUD MAXIMUM[1]	HUD MINIMUM[2]	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION	
					202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional
Eff.	415	N/A	473	418	422	451	N/A	N/A[3]	453	466	399	501	483	544
1BR	540	510	664	609	543	576	572	569	592	571	546	632	580	623
2BR	800	600	900	805	789	820	794	766	835	803	930	899	824	836
3BR	1,050	730	1,118	1,009	N/A	1,032	952	1,021	1,100	998	N/A[3]	1,228	1,030	1,032
4BR	1,150	910	1,215	1,170	N/A	1,197	1,281	1,226	1,362	1,330	N/A[3]	1,446	1,125	1,360
Sample Size			131	75	57	132	19	75	127	52	13	18	41	39

[1]Source: HUD Notice H81-65, Nov. 12, 1981. Maximum is applicable for 100 percent subsidized Section 8 projects planned and built after November 1981.

[2]Source: Comptroller General of the United States, How to House More People at Lower Costs Under the Section 8 New Construction Program, CED-81-54, March 6, 1981. Minimum was derived from Minimum Property Standards.

[3]Floor space could not be computed for these bedroom types due to missing data.

indicates maximum unit standards recently prescribed by HUD for 100 percent subsidized Section 8 projects.[11] It is clear that a substantial proportion of the housing stock produced under Section 8 during the seventies is roomier than the new standards would permit, given that the average floor space of most unit types exceeds the maximum permissable floor space.

The second set of standards, referred to as "HUD Minimum" in Table 4-5, was utilized by GAO in a recent report[12] and is based on HUD's Minimum Property Standards. The sizes indicated for the various bedroom types would pass the Minimum Property standards.[13] A comparison of actual sizes with these standards support GAO's finding that units developed in the past tend to be substantially larger than the minimum size considered adequate by the Minimum Property Standards.[14]

Residential Space. Our analysis of square foot costs also noted differences in the proportion of total space devoted to residential use within the different programs. The average newly constructed Section 8 project was about 80 percent residential, with the remaining space devoted to uses such as community rooms, maintenance areas, and commercial space. The proportion residential was significantly higher for Section 236 and unsubsidized FHA (87 percent) and significantly lower for Section 202/8 and Section 8 Rehabilitation (70 percent).

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[11]Note that these standards came into effect in November 1981, after construction completion of projects in our sample.

[12]See Table 4-5 for source.

[13]Minimum Property Standards do not provide a minimum size to which units of various bedroom type must conform. Rather, they specify the minimum size to which rooms must conform.

[14]The cost implications of this finding are beyond the scope of the present paper.

Interestingly enough, Public Housing is shown to have a fairly high proportion of space devoted to residential use. Although the higher costs of Public Housing have sometimes been attributed to their greater need for common space, these patterns are not revealed by our sample data.

Project Amenities. As evident from Table 4-4, unsubsidized projects are more luxurious than projects developed under any of the subsidized program variants. Many of the former tend to have tennis courts and swimming pools, features which are virtually non-existent in subsidized projects. Apartment-specific amenities provided at substantially greater frequencies in unsubsidized units include dishwashers, drapes, disposals and carpets.

Among subsidized new construction, Section 236 appears to have certain amenities (drapes, kitchen fans, carpets, recreation rooms and playground) less frequently than Section 8 projects. Among new Section 8 units, amenities are provided at approximately the same overall frequency across the different financing and processing variants. In particular, no strong evidence exists that SHFA-processed projects are more luxurious (as is often claimed) than HUD-processed projects. The only exception is perhaps the presence of intercoms and balconies in a fair proportion of projects.

Insured substantial rehabilitation projects appear to be somewhat more austere than new projects (particularly in terms of presence of drapes, disposals, kitchen fans, carpets, recreation rooms, and playgrounds). However, state non-insured substantial rehabilitation resembles Section 8 new construction in terms of the frequency of amenities.

Public Housing projects, particularly Conventional projects, appear most devoid of unit specific amenities along almost all dimensions, although project-wide amenities (recreation rooms, laundry facilities, and playgrounds) occur at rates comparable with Section 8 programs. However, a fair proportion of Public Housing projects (15 to 20 percent) have intercoms

and/or balconies, both of which are virtually non-existent among most Section 8 projects.

Density. The data presented in Table 4-4 show a remarkable similarity in lot size per unit among new construction programs, varying between 2,600 and 2,800 square feet per unit, with the highest densities occurring in the Section 202/8 program. The exception is the state insured program, with lot sizes of almost 3,100 square feet per unit. Public Housing tends to have the most land per unit. The amount of land available for Conventional projects is particularly large, at close to 7,000 square feet per unit. Not surprisingly, substantial rehabilitation tends to occur in much denser projects, with typically less than half the amount of land per unit relative to new construction.

Some of the above mentioned patterns in density are reflected in the average number of stories per project. The new construction programs typically build projects three to four stories high. Surprisingly, this includes Public Housing, which indicates that the average project contains a substantial amount of unimproved grounds. Unsubsidized projects tend to have the least number of stories (around 2), while Section 202/8 and substantial rehabilitation projects have the most, ranging up to an average of 5.5 stories. It is important to realize, however, that the data indicate the existence of a substantial degree of within-program heterogeneity in terms of density. The low eta^2 shows that 92 percent of all variance in number of stories occurs within the programs rather than between programs. This points again to great variations in the types of projects constructed under each program variant.

Structure Type. Density patterns are also reflected in the types of structures built under the various programs. Unsubsidized projects are for the majority walk-ups, while Section 202/8 projects and FHA insured substantial rehabilitation are mainly elevator buildings. The mix of projects within other program variants appears to be more

evenly distributed among various structure types, although elevator buildings tend to make up the largest category for most programs.[15] A notable exception to the latter tendency occurs in Public Housing, which tends to have more semi-attached or detached projects than other progams, particularly among the Conventional program, with almost 40 percent of its projects of this type.[16] This finding is consistent with the large average lot size per unit, which probably reflects the presence of backyards.

Exterior Finish. Since many different combinations of exterior finish were found, resulting in some 28 categories, various types of materials were combined into six groups. "Durable" includes such finishes as stone, masonry, brick and concrete or combinations of these. "Mixed durable" implies a mixture of a durable finish with a less-durable, such as wood, stucco or siding. "Other" implies a mixture of less-durable finishes. Several patterns are evident. First, more than half of the unsubsidized new projects consist of less-durable materials, which is a substantially greater frequency than exists among subsidized projects. Among Section 8 projects the most durable new projects appear to be constructed under the SHFA insured program, while the SHFA non-insured projects tend to use less durable materials most frequently. However, among

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[15]Note that the "non-mixed" categories imply that a project consists solely of that type of structure. The category "mixed" implies that a project consists of two or more structure types.

[16]In order to test whether the unusually high per unit costs of Public Housing projects was due to the high concentraton of this building type, we examined costs per unit after eliminating this structure type. The resulting average per unit costs were slightly higher for Public Housing than when all structure types were combined. This indicates that semi-attached or detached projects are not directly responsible for the high average per unit costs.

substantial rehabilitation programs the use of the latter types of finishes is virtually non-existent. They are also rarely used in Conventional Public Housing projects, although Turnkey projects tend to use them at the same rate as Section 8 projects.

Scattered Site. Another factor which is often thought to increase costs is scattered site development. The data show that the lowest frequency of scattered site development occurs under the two large FHA-insured Section 8 new programs (HUD and SHFA processed), as well as under SHFA-insured substantial rehabilitation, with both HUD and SHFA programs showing less than 5 percent scattered site development. Most other programs have between 15 and 20 percent of their projects on scattered sites, with Public Housing and SHFA non-insured substantial rehabilitation projects somewhat exceeding these trends at about 25 to 30 percent.

Percent Elderly. Since projects intended for the elderly may require expensive designs, it is interesting to compare the proportion of elderly projects among program types. A project was defined as elderly if all units, except one or two, were designated as occupied by elderly households. It is clear that unsubsidized projects, as well as Section 236 projects, are rarely specifically designated for the elderly, while 5 to 6 out of every 10 new Section 8 projects are termed elderly projects. Among substantial rehabilitation projects about 4 out of every 10 projects are elderly, as are about one-third of Public Housing projects.

4.2.2 Locational Characteristics[17]

For the purpose of the cost analysis the characteristics of the location of the projects are mainly of interest because

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[17]Location was obtained from the MIS, MIDLIS and FORMS data tapes. Neighborhood conditions and property value trends were obtained from developer surveys.

of their potential impact on land[18] costs as well as on carrying charges, since taxes and insurance included in the latter are often a function of location. In addition, it is interesting to examine to what extent the various program variants serve different sorts of markets. The data are presented in Table 4-6. No eta^2 statistics are shown since they are not appropriate for these types of variables.

Location. With the exception of Section 202/8 projects, Section 8 new construction projects tend to be fairly evenly distributed between SMSAs and non-metropolitan areas. HUD/FHA projects tend to be somewhat more concentrated in SMSAs (57 percent) while 11(b)s and SHFA processed projects are located somewhat more frequently outside SMSAs. SHFA projects which are located in SMSAs tend to be about evenly divided between the suburbs and the central city, while 11(b)s and HUD/FHA tend to be located in the central city more frequently. Projects constructed under the Section 236 and Section 202/8 programs, all substantial rehabilitation projects as well as unsubsidized projects, tend to be heavily concentrated in SMSAs. Moreover, only unsubsidized projects are concentrated in the suburbs of the SMSAs, while subsidized projects tend to be located in the central city. The location of Public Housing projects differs between Conventional and Turnkey. Turnkey is concentrated in SMSAs, skewed toward central cities, while over half of Conventional projects are located in non-metropolitan areas.

Size of Place. Most program types which tend to be concentrated in non-metropolitan areas (namely, SHFA processed new construction and Conventional Public Housing) tend to be especially geared toward small places of fewer than 10,000

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[18]Recall, however, that our Land Deflation Index factors out differences in land costs between central city and other locations.

Table 4-6

LOCATIONAL CHARACTERISTICS OF PROJECTS[1]
(Weighted)

TYPE OF CHARACTERISTIC	UNSUBSIDIZED	SUBSIDIZED									
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional
LOCATION[a]												
Non-SMSA	14.3 %	23.7 %	23.9 %	43.1 %	57.0 %	59.6 %	53.5 %	22.8 %	20.0 %	2.3 %	35.0 %	56.3 %
SMSA												
Central City	38.8	56.5	50.0	33.7	35.5	18.8	24.2	65.5	40.0	78.7	39.8	22.7
Suburb	46.9	19.8	26.1	23.2	7.5	21.6	22.3	11.7	40.0	19.0	25.2	21.0
SIZE OF PLACE[a] (in thousands)												
Non-SMSA												
LT 10	5.1 %	13.0 %	9.2 %	22.1 %	14.0 %	31.3 %	31.7 %	7.6 %	5.0 %	0.0 %	23.3 %	33.2 %
10-49.9	9.2	10.8	14.7	21.0	43.0	28.3	21.9	15.2	15.0	2.4	11.7	23.1
SMSA												
50-249.9	13.9	13.2	10.8	15.4	7.5	7.1	9.7	1.4	0.0	0.0	14.1	7.8
250-999.9	34.4	21.6	26.3	16.1	6.7	19.0	12.2	32.4	35.0	28.5	37.3	30.2
1000-2499	26.2	28.6	30.2	19.1	28.8	10.8	12.5	15.4	25.0	27.9	12.3	3.3
GE 2500	11.3	12.8	8.9	6.2	0.0	3.4	12.0	28.1	20.0	41.2	1.2	2.5
NEIGHBORHOOD CONDITIONS[a]												
Above Average	56.0 %	30.4 %	36.6 %	30.2 %	0.0 %	33.8 %	41.8 %	5.3 %	54.5 %	21.4 %	14.2 %	29.9 %
Average	41.6	46.3	39.5	53.4	63.4	42.0	39.1	44.8	9.1	49.4	53.1	41.1
Slight Deterioration	2.3	6.9	20.7	9.3	36.6	9.7	13.0	20.7	9.1	4.4	23.8	13.5
Deteriorated or Blighted	0.0	16.5	3.1	7.1	0.0	14.5	6.1	29.2	27.3	24.9	9.0	15.5
NEIGHBORHOOD PROPERTY VALUES												
Rising faster than Market	22.1 %	10.5 %	22.7 %	17.4 %	31.0 %	11.8 %	20.0 %	22.9 %	27.3 %	44.6 %	14.6 %	17.6 %
Rising at same rate as Market	72.9	74.7	74.4	76.2	52.6	77.8	77.0	55.9	54.5	51.6	77.7	74.8
Stagnant or declining	5.0	14.9	2.9	6.4	16.4	10.4	2.9	21.2	18.2	3.8	7.7	7.6

[1]The level of significance at which Chi Square tests reject the hypothesis of equal distributions across program types is indicated as follows:

a = .001; b = .01; c = .05; d = .1.

people, with about one-third of all their projects located in such areas. Programs which primarily serve SMSAs appear to be focused mainly on mid-size SMSAs with populations of 250 thousand to 2.5 million. The largest SMSAs (over 2.5 million) seem to be served most frequently by the substantial rehabilitation programs, with about 20 to 30 percent of these programs' activities occurring in such areas.[19]

Neighborhood Conditions. Developers were asked to rate their project's neighborhood at the time of development as above average; average; beginning to deteriorate; deteriorated; or blighted. Not surprisingly, unsubsidized projects are rarely located in deteriorated neighborhoods, indicating risk aversion on the part of private developers. Subsidized new construction, including Public Housing, also operates primarily in average or above average neighborhoods, with no more than 16 percent of the projects in deteriorated or blighted neighborhoods. The new construction programs which reach out most frequently into deteriorated or blighted neighborhoods are Section 236, SHFA-insured and Conventional Public Housing. Projects constructed under Section 202/8 and 11(b) are rarely located in deteriorated neighborhoods but are found fairly frequently in slightly deteriorating neighborhoods. Given the nature of substantial rehabilitation, it is not surprising that between 25 and 30 percent of such projects are found in deteriorated or blighted areas. However, it should be noted that at the same time almost 55 percent of SHFA insured substantial rehabilitation projects are located in above average neighborhoods, which represents the largest concentration in such areas among all subsidized programs.

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[19]One must be extremely careful to conclude that 41 percent of SHFA non-insured rehabilitation is located in the larges SMSAs, since this figure may be biased by activities of the Massachusetts SHFA. The latter may not be representative of locations of activities sponsored by other SHFAs.

Neighborhood Property Values. Another indicator of neighborhood quality which would affect land costs is the movement of property values relative to the rest of the local housing market. This information was, again, obtained from the developer and pertains to the past three years. While neighborhood conditions would tend to provide a static view of the neighborhoods, property value trends provide some insight into the dynamics of neighborhood change. Among the new construction programs, including unsubsidized and Public Housing variants, around 75 percent of all projects tend to be located in stable neighborhoods, where property values had been rising at the same rate as the rest of the local market. Typically, another 20 percent of projects are built in revitalizing neighborhoods, with the remainder in declining neighborhoods.[20] On the other hand, only about half of substantial rehabilitation projects are located in stable neighborhoods, with the remainder typically split between revitalizing and declining areas. However, SHFA non-insured projects tend to be evenly divided between revitalizing and stable areas.

4.2.3 Characteristics of Project Developers

The characteristics of developers of the projects may affect project costs in several ways. Obviously, the absence of profits for non-profit developers would tend to decrease the bottom line development costs. On the other hand non-profit sponsors--or small, recently established firms--may be less efficient in the production of housing, causing increases in resource costs. The developer's profit-making status will also affect the project's long-term costs to the government, due to tax writeoffs associated with depreciation and the treatment of

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[20]Note that Chi Square tests do not reject the hypothesis of equal distributions across all program types combined. However the difference between rehabilitation and new construction was found to be statistically significant.

construction expenses. Accordingly, data on this (and other) characteristics of project developers are shown in Table 4-7.[21]

Sponsor Type. The great majority of all projects are developed by profit-making organizations. Program variants with the largest proportions of non-profit sponsors include Section 236 (18 percent) and the four SHFA-processed program types with proportions of non-profits ranging up to 36 percent for SHFA non-insured substantial rehabilitation. In general, substantial rehabilitation tends to be done more frequently by non-profits than new construction which perhaps reflects participation by local interest groups concerned with declining neighborhoods. The Section 202/8 program by law precludes participation by for-profit developers.

The syndication variable presented in Table 4-7 describes the proportion of all for-profit firms which are syndicated. There exists some variation among the various program types in the extent of syndication. For-profit developers of unsubsidized projects syndicate least frequently (at 37 percent) followed by developers of Section 236 and HUD/FHA projects, of whom about half syndicate. Developers of projects processed by SHFAs tend to syndicate more frequently than developers of HUD processed projects with frequencies ranging up to 83 percent among SHFA insured new construction and 100 percent for SHFA non-insured substantial rehabilitation.

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[21]Most data were obtained from developer surveys. However, the variable indicating profit status was obtained from FHA Form 2013 and similar forms for SHFA non-insured projects. For the Public Housing projects the data pertain to the PHA.

Table 4-7

CHARACTERISTICS OF PROJECT DEVELOPERS
(Weighted)

TYPE OF CHARACTERISTIC	UNSUBSIDIZED	SUBSIDIZED										
	221(d)(4)	236 RENT SUPPLEMENT	SECTION 8								PUBLIC HOUSING		
	NEW CONSTRUCTION	NEW CONSTRUCTION	NEW CONSTRUCTION					SUBSTANTIAL REHABILITATION			NEW CONSTRUCTION		
			202	HUD FHA	11-b FHA	State FHA	State Non-FHA	HUD FHA	State FHA	State Non-FHA	Turnkey	Conventional	eta[2]
SPONSOR TYPE													
Profit-Making[a]	98.8 %	81.9 %	0.0 %	98.9 %	100.0 %	91.4 %	83.7 %	95.7 %	75.0 %	63.6 %	0.0 %	0.0 %	N/A
Syndicated[a]	36.5	46.5	0.0	55.5	87.3	83.1	64.9	68.2	71.4	100.0	0.0	0.0	N/A
ORGANIZATION													
Number Employees	96	53	65	79	98	84	86	19	33	72	177	105	.036
Age[a]	18	15	26	16	10	19	16	13	12	17	28	29	.109
EXPERIENCE													
Total Projects Developed[a]	8	27	4	21	17	20	10	10	7	7	8	4	.080
Total Units Developed[a]	906	3,317	317	1,854	1,247	2,327	778	848	876	658	858	501	.059
Sample Size[3]	73	55	33	76	8	31	73	34	7	11	34	38	

[1]The level of significance at which F tests or Chi Square tests reject the hypothesis of equal means or distributions across program types is indicated as follows:

a = .001; b = .01; c = .05; d = .1.

[2]eta[2] indicates the proportion of variance explained by program type.

[3]Sample sizes refer to the number of observations available on project amenities.

Organization and Experience. For all 12 program types combined the differences in average number of employees was not found to be statistically significant. This indicates the existence of a large degree of intra-program variance in average size of the developer. One pattern which, however, deserves some attention is the small size of developers involved in FHA insured substantial rehabilitation. These firms also tend to be relatively new (12 to 13 years on average) when compared to firms involved in new construction, whose average age ranges from about 16 years in general to 26 years for the non-profit organizations participating in the Section 202/8 program. Public Housing Authorities tend to have been in existence for about 28 years on average and have relatively large average numbers of employees. However, again, there exists a great deal of variability among staff sizes, ranging from fewer than 5 to 1,400 employees.

Measuring experience in terms of total number of projects and/or units developed is probably a better indicator of experience than the age of the organization. This is particularly true for non-profit organizations, which may exist for other purposes beside the production of housing. This is evident from the low number of projects (4) and units (317) developed by the sponsors of Section 202/8 projects, who have been in existence longer on average than developers participating in other programs. The same comment holds for PHAs who tend to have developed few projects and units relative to the length of time they have been in operation. On the other extreme, developers of Section 236 projects have built more projects (27) and units (3,317) than the average developer in the other program variants. In general, developers participating in the subsidized new housing programs are more experienced than those building unsubsidized FHA units, with the possible exception of developers participating in the SHFA non-insured program. There is also a tendency for substantial rehabilitation developers to have less experience than those

developing new subsidized housing. This probably also reflects the fairly large proportions of non-profit organizations participating in these program types.

4.3 Processing Time

A final factor that could affect a project's costs is the length of the development period. Obviously, the amount of time between the beginning and the end of the construction will have a direct effect on development costs, since carrying charges will accumulate throughout the construction period. The amount of processing time prior to construction may also have an impact. However, in this instance, it is necessary to distinguish between the cost effects that are simply associated with the passage of time, and those that arise from an expenditure of additional resources.

In an inflationary environment, nominal construction costs will automatically increase with time; however, the change in real development costs will depend on the relative rate of inflation in the construction industry vis-a-vis the rate in the economy at large. Unless the increase in the price of construction inputs exceeds the overall inflation rate, the real cost of construction will be stable or decline.

Figure 4-1 presents statistics describing six-year trends in the CPI and Dodge Construction Index,[22] where both indices have been standardized to equal 100 in 1975. In general, inflation in the construction industry has exceeded the rate of increase in the CPI, implying a secular growth in real construction costs. This increase was particularly pronounced in our sample period. Between 1975 and 1979, the CPI increased at an annual rate of 6 percent, compared to a 7.7

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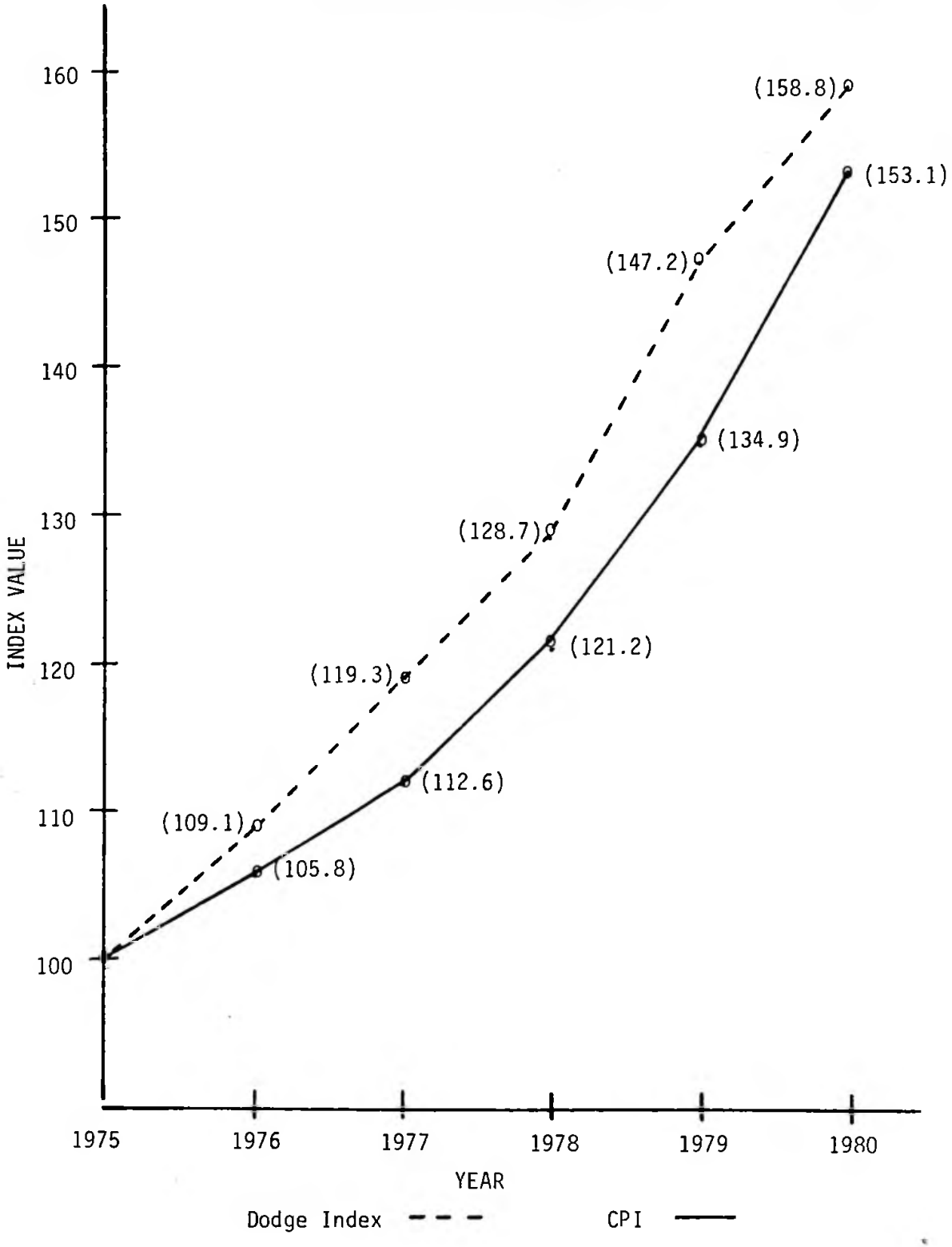
[22]Trends in the Dodge Construction Index were derived from our sample data and represent a weighted average of the localities in our sample.

Figure 4-1

COMPARISON OF INCREASES IN THE DODGE CONSTRUCTION INDEX AND THE CPI: 1975-1980



percent increase in the price of construction inputs. This differential produced an average increase of almost 2 percent per year in real construction prices. While the gap between the CPI and Dodge Index appeared to narrow in 1980 (primarily due to the dramatic increase in the CPI) this reversal of previous trends was not sufficient to offset the earlier growth in construction costs. As a result, throughout most of the recent past, a project's real costs have automatically risen with time.

However, the adjusted data that are presented in this report have already controlled for this inflationary effect. By adjusting each project's costs to reflect its 1980 construction and land price equivalent, we have factored out any differences produced by the date of the construction period. As a result, in our analysis any cost differences that are related to processing time will reflect underlying differences that would occur even in a non-inflationary period. Such differences would arise from an expenditure of additional resources associated with longer processing, and not just the passage of time.

With these caveats in mind, we turn to Table 4-8, which presents summary statistics on the length of the development period for the different program/financing variants. Two estimates of processing time are presented in the chart. The first was derived from program data on key processing dates; the second was derived from data collected in the developers' survey. While neither set of estimates is entirely satisfactory, they both suggest some basic patterns that occur across program types.

In general, the designation of the beginning and the end of the construction period was fairly comparable across the programs. As a result, the statistics in Table 4-8 provide reasonably accurate estimates of programmatic differences (or similarities) in construction time. However, specifying the date on which the development of a project began was an extremely difficult -- and inherently ambiguous -- task. Since

Table 4-8

THE LENGTH OF THE DEVELOPMENT PERIOD: MONTHS
(Weighted)

	Program Definition				Developers' Survey			
	Processing Time	Construction Time	Total	Sample Size	Processing Time	Construction Time	Total	Sample Size
SECTION 8								
NEW CONSTRUCTION								
202	15.1	14.6	29.7	57	16.7	14.4	31.0	25
HUD FHA	15.1	13.2	28.3	135	15.1	11.9	27.0	56
11(b) Insured	16.5	12.9	29.4	19	18.5	11.8	30.3	8
SHFA FHA	N/A	15.2	N/A	78	16.6	14.2	30.8	26
SHFA Uninsured	13.4	12.4	25.8	83	14.5	11.1	25.6	44
SUBSTANTIAL REHABILITATION								
HUD FHA	14.2	11.9	26.2	56	13.1	12.0	25.1	32
SHFA FHA	N/A	11.4	N/A	13	18.7	12.0	30.7	6
SHFA Uninsured	26.6	12.5	39.1	13	17.2	9.8	27.0	10
PUBLIC HOUSING								
Turnkey	42.0	14.0	44.0	52	25.5	12.8	38.4	27
Conventional	68.3	15.6	84.0	52	32.5	20.4	52.9	28
236 RENT SUPPLEMENT	N/A	17.7	N/A	54	10.8	12.6	23.4	24
UNSUBSIDIZED 221(d)4	N/A	13.3	N/A	131	10.3	11.7	21.5	54

the different programs recognize and record different milestones in the development process, the statistics presented in the chart provide only rough estimates of the differences that exist across the different program types.

The first three columns of Table 4-8 were primarily derived from HUD MIS data. In general, we attempted to define the beginning of the development period as the initial application date, where an "initial application" described the characteristics of the project and presented estimates of total costs. For HUD-processed Section 8, we used the MIS's "Proposal Received Date," which could signify either a preliminary or final submission; for uninsured SHFA projects, we collected initial application dates from the agencies themselves; and for Public Housing projects, we used the "Initial Fund Reservation Date." While this latter date generally preceeds a project-specific proposal by at least a year, it was the only information readily available from HUD. Due to omissions (or inconsistencies) in the other MIS data, preconstruction processing times could not be obtained for the remaining program types.[23]

In general, HUD MIS data show relatively little variation in the length of the construction period. Section 236 did record significantly longer construction periods, undoubtedly due to the program's preponderance of very large projects. Among the remaining program types, there is some tendency for construction time to be relatively low for substantial rehabilitation and SHFA-processed projects, and relatively high for

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[23]For SHFA-processed projects, the "Proposal Received Date" represents the date on which the state's (and not the developer's) proposal was received by HUD and thus could not be used. Since we conducted onsite visits to collect data on uninsured SHFA projects, we were able to collect application dates from the SHFAs; however, since SHFA-FHA records were collected from HUD, such data were not obtained. While application dates were theoretically available from the MIDLIS system for Section 236 and unsubsidized FHA projects, these data elements were always missing on the tapes.

Section 202/8 and Public Housing. However, the range in the estimated means for the various programs is under 4 months, a difference that is fairly trivial.

There is also considerable stability in the estimated length of the pre-construction period, at least among the different Section 8 program variants. In general, processing time is slightly lower for SHFA-processed Section 8, but the difference is less than two months. While processing time is dramatically higher for Public Housing, such estimates are based on the Fund Reservation Date, which is not strictly comparable to the application date that is used in the other programs. For Turnkey projects, fund reservation preceeds the issuance of a request for a developer's proposal, and for Conventional projects, fund reservation can preceed the submission of a development program by as much as a year.

The next three columns in Table 4-8 describe the developer's response to a series of questions regarding key processing dates, where the developer for Public Housing is always defined as the PHA. Again, the "initial application" was defined as the date of the first full submission of project data. Since PHAs were asked to provide the same information as other developers, the definitional problems that were inherent in MIS data should be reduced if not eliminated.

In general, information obtained from the developers' survey is quite consistent with the MIS data. The length of the construction period is again fairly constant, although it appears to be somewhat higher for Conventional Public Housing. Pre-construction processing time averaged about 13 to 18 months for Section 8 projects, with HUD- and SHFA-processed projects displaying relatively little variation. Both Section 236 and uninsured FHA projects had fairly short processing times, with an average of just 10 months.

In contrast, Turnkey and Conventional Public Housing had pre-construction development periods that averaged about 26 and 33 months, respectively. Although the overall processing and construction time was shorter for Turnkey projects, it was

still about 11 months longer than the average Section 8 development, and about 16 months longer than unsubsidized FHA. These large differences in pre-construction processing time between Public Housing and the other kinds of subsidized and unsubsidized projects has certainly led to markups in their real development costs. Since the prices of construction inputs have risen at a rate that exceeded general inflation by about 1.7 percent per year, the simple passage of time will cause Conventional Public Housing to be at least 4 percent more expensive in "real" terms than an unsubsidized FHA project initiated at the same point in time. The longer processing time associated with Public Housing may also lead to differences in the development costs of projects that are adjusted for inflation in the price of land and construction inputs. Whether or not they do is considered in Chapter 5.

4.4 Summary

While the analysis in this chapter has shown that there exists a great deal of intra-program variation in the costs and types of projects produced, several major patterns reflecting systematic differences between the twelve program/financing variants have emerged. The following key findings pertain to per unit cost differentials.

- With a few exceptions, the variation in per unit improvement costs among the different new construction programs is fairly modest. Costs range from $22,000 for unsubsidized units to about $25,000 for Section 236 Rent Supplement and SHFA uninsured units. This range suggests a maximum difference of about 12 percent between unsubsidized FHA and most kinds of subsidized new construction. However, Section 202/8 and Public Housing units are substantially more expensive than unsubsidized units, with differences ranging from 29 percent for Section 202/8 to around 60 percent for both Public Housing variants.

- These differences among the new construction programs persist when other hard cost components--land and off-site costs--are added to improvements. In addition, the hard costs of FHA insured substantial rehabilitation are shown to be virtually identical to

the costs of newly constructed unsubsidized units. However, the hard costs of SHFA non-insured substantial rehabilitation exceed the costs of such units by 34 percent.

- Due to the tendency for programs with relatively high hard costs to have relatively low soft development costs, the differences in total development costs per unit were less pronounced and basically disappeared for the SHFA non-insured new construction program. The cost of HUD-processed Section 8 new construction was about 4 percent higher than unsubsidized FHA, while Section 236 Rent Supplement and Section 202/8 had differentials of 9 and 12 percent, respectively. The largest markups are again observed for Public Housing, whose total development costs are some 37 percent higher than the costs of unsubsidized FHA.

Comparing program costs on a square foot, as opposed to unit basis provided a first glance at the existence of considerable variation in the types of projects produced under the various program financing variants. The total development costs of unsubsidized new construction ($32/foot) became substantially lower than those for all types of subsidized new construction, with markups ranging from 13 percent for Section Section 236 to 72 percent for Turnkey Public Housing. The relative ranking of the various subsidized programs also changed to some extent. In particular, Section 236 units became somewhat cheaper than HUD- or SHFA-processed Section 8, and Section 202/8 units became more expensive. Among the substantial rehabilitation programs, costs for state uninsured units becomes virtually identical to those for HUD-FHA units, with costs for all three rehab variants remaining below those of new construction Section 8. Finally, Turnkey Public Housing becomes ten percent more expensive than Conventional Public Housing.

Changes in the relative ranking of program costs when expressed on a square foot, as opposed to unit basis, are for the most part explained by systematic differences in the average size of units produced under the various program variants. Average unit sizes were found to be systematically larger in unsubsidized projects (821 square feet) when compared

to subsidized projects, which ranged from 539 square feet for Section 202/8 units to 787 square feet for Section 236 units. Among subsidized program/financing variants, units developed under Section 236 and Public Housing (particularly Conventional Public Housing) tended to be larger than those developed under Section 8. Among Section 8, by far the largest units on average were found within SHFA uninsured substantial rehabilitation, while not surprisingly, Section 202/8 units tended to be smallest.

Analysis of another dimension of project size, namely average number of units per project, revealed considerable within program variation in this characteristic. However, unsubsidized projects did tend to be larger, with an average of 115 units, than most projects developed under subsidized programs. The exceptions among the latter were Section 236 projects and, particularly, SHFA insured substantial rehabilitation projects (which contained an average of 147 units). Program variants which tended to favor smaller projects were SHFA non-insured variants and Turnkey Public Housing, both of which averaged around 70 units per project.

Analysis of project characteristics other than size revealed further systematic differences among programs.

- Unsubsidized projects have substantially more amenities than subsidized projects. However, they tend to be primarily low-rise walk-up apartment buildings, frequently built out of less-durable materials, and rarely specifically designed for the elderly. They tend to be located relatively frequently in the suburbs of midsized SMSAs and hardly ever in declining or deteriorating neighborhoods. The developers of these projects do not syndicate as frequently and tend to have substantially less experience, both in terms of number of projects as well as units developed, relative to non-PHA developers or subsidized new projects.

- Except for their larger size, Section 236 projects appear to be of somewhat lower quality than Section 8 projects. They tend to have certain amenities (drapes, carpets, recreation rooms and playgrounds) less frequently than Section 8 projects and the use of less durable building materials is somewhat greater than

among Section 8. Like unsubsidized projects, they are rarely designed for the elderly. The majority of Section 236 projects are located in central cities of the larger SMSAs, where they tend to be found more frequently in deteriorated neighborhoods than Section 8 projects. Their developers have more experience than developers in any other program type, at least at the time that our survey was fielded.

- Among Section 8 new construction no substantial variation exists in amenities provided. In particular, no strong evidence was found that the states "gold plate" their new projects, at least not along the dimensions measured by our variables. The composition of structure types and building materials was fairly similar, with the exception of the preponderance of multi-story elevator buildings among Section 202/8 projects. State and 11(b) financed projects tended to be geared somewhat more toward non-metropolitan areas, with over half of their projects located there. The SHFA-financed projects were found to be particularly concentrated in very small places and were located perhaps a bit more frequently in blighted areas than other Section 8 variants. SHFA-financed projects also tend to have non-profit developers more frequently, a tendency which at least partly explains the relatively low experience levels of developers participating in the SHFA non-insured program.

- Projects developed under the substantial rehabilitation programs were found to be somewhat less luxurious in terms of amenities than Section 8 new projects. However, the SHFA non-insured variety appeared more similar to new projects in this respect. Housing produced under substantial rehabilitation was found to be more dense, evidenced by smaller lotsizes per unit and larger proportions of high rise elevator buildings, most of which tend to have durable finishes. Most rehabilitation tends to be in central cities of SMSAs with populations of 250,000 and up, with more than one quarter of the projects in deteriorated or blighted areas. Developers tend to be smaller, with less experience and more frequently non-profit than developers of new subsidized housing.

- Public Housing units are generally most austere in terms of amenities, although Turnkey projects do tend to provide project-wide amenities at levels similar to Section 8. Building types include substantial proportions of low-density semi-attached or detached structures, particularly in Conventional projects. The great majority (almost 90 percent) of the latter are at

least partially constructed of durable materials compared to less than two-thirds of Turnkey projects. Projects specifically designed for elderly compose about one-third of the total, which is less than in Section 8. Like SHFA sponsored new construction, more than half of Conventional projects are located outside SMSAs and particularly concentrated in small places, while Turnkey projects, again, resemble Section 8 projects in terms of location.

Chapter 5

EXPLAINING VARIATIONS IN PER UNIT DEVELOPMENT COSTS

As we have seen in the previous chapter, development costs vary quite significantly across the different program/financing types, even after controlling for differences in the price of construction inputs across cities and over time. One possible reason for this variation is immediately evident from an examination of the projects that have been developed under the different programs. As we have seen, projects vary along a number of important dimensions that could have a major impact on development costs.

This chapter attempts to control for differences in costs that are associated with the kinds of units produced, and with a host of other factors that might have an impact on the project's costs, such as the characteristics of the sponsor and the quality of the project's neighborhood. In controlling for such factors, the analysis enables us to identify certain program variants that produce equal quality housing at considerably lower development costs.

The chapter first examines the "hard" components of development costs, including improvements, offsite costs, and land. It begins with an analysis of such costs for newly constructed projects. Separate regressions are estimated for land and improvements, where all costs are adjusted to reflect 1980 dollars and expressed on a "per unit" basis. The analysis then combines land and improvement costs to consider the relative

efficiency of new construction and substantial rehabilitation. Since the value of the shell is included in the value of "land" for renovated projects -- as opposed to the costs of improvements -- distinctions regarding building and property expenditures for substantial rehabilitation proved infeasible.

Subsequent sections of the chapter consider the impact of variations in the "soft" components of development costs. Regression analysis is first employed to identify factors that influence a project's carrying charges. The analysis then combines the various components of development costs -- soft as well as hard -- and fits a regression for Total Development Costs. This last regression considers the combined impact of factors shown to influence the individual components of development costs. As we have seen, some programs which have relatively high costs for one type of expenditure may have relatively low costs for others. As a result, this last regression is required in order to identify net differences in relative costs across the different program/financing types.

The next section of the chapter considers program costs from a different perspective. While the regression analysis examines the cost of producing an identical unit under the different program variants, this part of the analysis examines actual program costs. In particular, it attempts to decompose the observed difference in the average costs of subsidized and unsubsidized housing into two major components: differentials that arise from differences in the characteristics of the projects built, and differentials that are associated with the particular program/financing variant. Such an analysis enables us to determine the extent to which the relatively high development costs that characterize some program variants are the result of "over-building." The final section of the chapter summarizes the major findings.

5.1 Hard Development Costs: New Construction and Substantial Rehabilitation

This section takes a detailed look at the "hard" components of development costs, which typically account for about 80 percent of a project's costs. It begins with an examination of improvement, land and offsite costs for newly constructed projects, and then expands the analysis to incorporate substantial rehabilitation. The results of these analyses suggest that there are significant variations in the "bricks and mortar" costs of otherwise similar projects developed under different program or financing variants.

5.1.1 Improvement Costs: New Construction

Table 5-1 presents the results of a regression equation relating a project's per unit improvement costs to some 36 different variables describing characteristics of the project and its sponsor, as well as the basic program/financing type. Data for this analysis were again drawn from standard program processing forms or from our supplemental survey of PHAs and project developers. As described earlier in this report, the kinds of variables that could be included in this analysis were primarily governed by the nature and content of project attribute data available on HUD Form 2013.

In all, the estimated regression equation does a fairly good job in explaining improvement costs, accounting for some 59 percent of the overall sample variance. The dependent variable has been adjusted by the Dodge Construction Index, and is expressed in logarithmic terms. Thus, the estimated regression parameters show the percentage effect that a unit change in a given variable has on a project's per unit improvement costs.[1] As noted above, the regression is restricted to

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[1]For a dummy variable, D_i, with a coefficient of "a_i," the estimated percentage effect on costs is given by:

$$\frac{C/D_i}{C_o} = e^{a_i} - 1$$

where C_o is improvement cost when $D_i = 0$.

Table 5-1

REGRESSION OF PER UNIT IMPROVEMENT COSTS:
New Construction Only
(Semi-log)

INDEPENDENT VARIABLES	Regression Coefficient (β)	Standard Error (σ)	Mean of Independent Variable
CONSTANT	2.8208		
PROJECT CHARACTERISTICS			
1. Elderly (Yes=1/No=0)	-.0135	.0324	.459
2. Project Size[1]			
a. 50- 99 Units (Yes=1/No=0)	.0841[a]	.0255	.344
b. 100-149 Units (Yes=1/No=0)	.0610[b]	.0308	.233
c. 150 or More Units (Yes=1/No=0)	.0542[d]	.0351	.180
3. Average Number of Stories	.0235[a]	.0044	3.338
4. Structure Type[2]			
a. Row/Walkup (Yes=1/No=0)	.0012	.0346	.222
b. Elevator (Yes=1/No=0)	.0798[c]	.0427	.328
c. Mixed (Yes=1/No=0)	.0216	.0376	.228
5. Average Land/Unit (1,000s square feet)	.0096[c]	.0000	2.916
6. Exterior Finish[3]			
a. Durable (Yes=1/No=0)	.0135	.0286	.345
b. Mixed Durable (Yes=1/No=0)	-.0329	.0290	.281
c. Wood (Yes=1/No=0)	-.0083	.0317	.196
7. Proportion Residential	-.4908[a]	.1073	.809
UNIT CHARACTERISTICS			
1. Average Size (1,000s square feet)	.4338[a]	.1173	.698
2. Distribution of Bedrooms[4]			
a. Percent One Bedroom	.1540[b]	.0749	.586
b. Percent Two Bedroom	.2338[b]	.0971	.259
c. Percent Three Bedroom	.2899[b]	.1182	.098
d. Percent Four or More Bedroom	.4311[b]	.2017	.017
3. Distribution of Bathrooms[5]			
a. Percent One-and-One-Half Bathrooms	.0784[d]	.0542	.081
b. Percent Two or More Bathrooms	-.0109	.0948	.035
4. Amenities and Equipment[6]			
a. Index of Unit Amenities	-.0002	.0077	4.836
b. Index of Project Amenities	.0030	.0109	2.028
SPONSOR CHARACTERISTICS			
1. Type			
a. For-Profit (Yes=1/No=0)	-.0328	.0410	.722
b. Syndicated (Yes=1/No=0)	-.0571[b]	.0275	.637
2. Number of Employees	.0001	.0000	89.111
3. Units Previously Developed (1,000s)	-.0014	.0000	1.295
BUILDERS PROFIT INCLUDED (Yes=1/No=0)	.0645	.0497	.115
PROGRAM DUMMIES			
1. Section 8 New Construction			
a. 202/8	.2254[a]	.0638	.081
b. HUD FHA	.1028[b]	.0419	.189
c. 11-b FHA	.0729	.0728	.027
d. State FHA	.1475[a]	.0481	.109
e. State Non-FHA	.1604[a]	.0437	.185
2. Public Housing New Construction			
a. Turnkey	.4383[a]	.0709	.058
b. Conventional	.3302[a]	.0743	.056
3. 236 Rent Supplement	.0691	.0513	.108
R^2 = .587 F = 13.79 Standard Error = .174 Sample Size = 713			

[a]Significant at 99 percent.
[b]Significant at 95 percent.
[c]Significant at 90 percent.
[d]Significant at 85 percent.

Footnotes to Table 5-1

[1]Project Size was divided into four categories. The missing or base category is : "5 to 49 units."

[2]Structure Type was divided into four categories. The missing or base category is: "semi-attached or detached." The "mixed" category implies that projects contained more than one structure type.

[3]Exterior Finish was divided into four categories. The missing or base category is: "other," which indicates materials such as stucco, manufactured siding or combinations of non-durables. The category "durable" includes materials such as concrete, brick, stone, masonry or combinations of these. The category "mixed durable" includes combinations of hard durables and non-durables.

[4]Each project was characterized by the proportions of units with various numbers of bedrooms, ranging from zero bedroom units (efficiency apartments) to units with four or more bedrooms. The missing or base case is the proportion of efficiency apartments.

[5]Each project was characterized by the proportions of units with various numbers of bathrooms, ranging from one bathroom units to units with two or more bathrooms. The missing or base case is the proportion of units with one bathroom.

[6]The index of unit amenities is simply the number of unit-specific amenities in a project, while the index of project amenities is the number of project-specific amenities. Unit-specific amenities include: air conditioning, dishwashers, drapes, balconies, intercoms, refrigerators, kitchen fans, disposals and carpets. Project-specific amenities include: laundry facilities, tennis courts, recreation rooms, swimming pools and playgrounds.

the subset of newly constructed projects, which constitutes about 89 percent of the total sample.

The major focus of our analysis is obviously on the program/financing variables, whose coefficients will enable us to estimate the relative costs of producing "otherwise similar projects" under the different program types. However, the reliability of these estimated coefficients depends critically on the ability of the other variables to capture other important factors that may influence development costs. As a result, this section will discuss the individual variables in some detail, leaving a description of estimated program effects to the end of the section.

Project Characteristics. The first set of variables included in the regression equation describe a number of key features of the project as a whole. They include: (1) tenant type (i.e., elderly versus mixed or family); (2) project size; (3) average number of stories; (4) structure type; (5) density (as measured by the average amount of land per unit); (6) exterior finish; and (7) proportion residential. The latter variable was included in the regression equation to adjust for instances when a fairly significant proportion of the project's floor space (and, presumably, costs) was devoted to commercial activities.

As is evident from Table 5-1, one factor that has an impact on improvement costs is the size of the project itself. Three dummy variables were included to capture size, with a base case of "5 to 49 units." The coefficients of these dummies thus show the proportionate cost differential relative to the smallest category of project size (i.e., 5-49 units). The results of our analysis suggest a non-linear relationship between project size and per unit improvement costs. While unit costs are generally higher for larger projects -- presumably reflecting diseconomies of scale -- the size of the differential tends to decrease with project size. According to

our estimates, projects in the "50-99 unit" range generally have the highest per unit costs.

Elevator buildings -- and, coincidentally, buildings with a large number of stories -- are also shown to have higher per unit costs when compared to other structure types. According to our regression, each additional story adds about 2 percent to a unit's improvement costs, with the average elevator project about 8 percent more expensive than single-family dwellings, walkups, or rows. However, once one controls for structure type, our analysis also indicates that project density (as measured by the amount of land per unit) leads to a decrease in improvement costs. In general, projects with more land per unit had higher unit costs, with an increase of 2,400 square feet (one standard deviation) producing a 2.3 percent increase in unit costs. The proportion of the project's floor space that was residential also proved significant; on average, a 10 percent increase in this variable produced a 5 percent decrease in unit costs. This negative relationship is understandable, since all of the project's costs have been assigned to its dwelling units.

The other project-wide variables included in the regression equation -- namely, exterior finish and tenant type -- proved to be insignificant[1]. The failure of these variables to display a significant relationship to project costs probably means that their impact is already captured by the other included variables. This is most evident for elderly projects, which tend to be concentrated in high-rise elevator buildings. Our analysis does not imply that the average elderly project costs the same as the average project designed

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[1]Preliminary regression analysis on the subsample of Section 8 projects also included a variable measuring the proportion of the project's units that were subsidized. The variable proved insignificant and did not affect the estimated program markup.

for families. Rather, it suggests that, once one controls for such differences in design, no significant cost differential remains[2].

Unit Characteristics. The second set of variables included in the regression describes the characteristics of the units themselves. Four major factors are considered, including: (1) unit size; (2) bedroom count; (3) the number of bathrooms; and (4) dwelling equipment and amenities. The latter variable is measured by two separate indices. The first index refers to equipment that is specific to the individual dwelling unit, such as air conditioning and carpeting; the second index refers to amenities that are shared or project-wide, such as swimming pools and laundry rooms. Both indices are simply sums of the number of amenities present.[3] While preliminary regression analysis experimented with other ways to specify these variables -- including individual listings of the different amenities, as well as principle components analysis -- such modifications introduced problems of co-linearity, and did little to improve the equation's fit.

Three of the four factors describing the project's units proved significant in the regression equation. Average unit

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[2]Additional analysis of differences in the costs of family or elderly projects is presented in Chapter 6.

[3]"Unit amenities" include: (1) air conditioning; (2) dishwashers; (3) balconies; (4) intercoms; (5) refrigerators; (6) kitchen fans; (7) disposals; (8) carpeting. "Project amenities" include: (1) laundry rooms; (2) tennis courts; (3) recreation rooms; (4) swimming pools; and (5) playgrounds.

size had a large and significant impact on per unit improvement costs. For example, increasing floor space by 180 square feet (one standard deviation) increased per unit costs by about 8 percent. Unit costs also tended to rise with the unit's number of bedrooms, even controlling for overall size; however, as the number of bedrooms increased, the increment in costs declined. And, finally, the presence of an additional half-bath appeared to add about 8 percent to a unit's costs.

Interestingly enough, neither the index for project nor unit amenities proved to be significant in the regression equation. While such factors obviously have an impact on construction costs, their effect appears to be fairly small in comparison to the other variables. The relative unimportance of a project's amenities in explaining variations in improvement costs is somewhat ironic, given the emphasis often placed on the dangers of "gold-plating" in subsidized housing. Indeed, our analysis suggests that other basic design features have far more bearing on a project's costs, including structure type, height, density, and project and dwelling size.

Sponsor Characteristics. A third set of variables included in the regression equation describe the characteristics of the project's sponsor, where "sponsor" in Public Housing was always defined as the PHA. Four different variables were employed in the analysis, including: (1) type (profit versus non-profit); (2) syndication status; (3) the number of employees in the sponsor's firm; and (4) the number of units previously developed. These last two variables were included in the regression to see if more experienced developers constructed units at lower costs.

While the size and past experience of the sponsor were not significant, improvement costs did tend to vary with developer type. In general, profit-making developers of syndicated projects constructed units at a lower cost than either non-profits or non-syndicated for-profits. When the "syndication status" variable was excluded from the equation, the dummy for "profit-

maker" became significant, indicating a fairly strong cost differential between for-profit and not-for-profit sponsors. Assuming that the other variables in the regression equation capture underlying differences in construction quality, these findings suggest that profit-making firms -- particularly those that syndicate their projects -- are more efficient producers of housing projects, at least when viewed from the perspective of improvement costs.

Indicator for Imbedded Profit. Another factor that was included in the regression equation was a dummy variable indicating instances when improvements costs might contain a builder's profit. All conventional public housing projects fall into this category; in addition, it includes a small number of FHA and SHFA projects in which a non-profit sponsor entered into a lump-sum construction contract.[4] Inclusion of this variable should make the improvement costs of conventional Public Housing more compariable to the costs of the other program variants, since it factors out the soft costs that are imbedded in the Public Housing data. Although the estimated coefficient of this variable had the expected sign and general magnitude (about 7 percent), it was statistically insignificant in the regression equation presented in Table 5-1.

Program/Financing Variables. The final set of variables appearing in the estimated regression for improvement costs consists of a set of 8 different dummies indicating the project's relevant program and financing variant. The base case for these variables is an unsubsidized, newly constructed FHA project. As a result, the estimated regression coefficients show the percentage cost differential of each

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[4]Builder's profit was always identified for non-profit sponsors who entered into cost-plus construction contracts.

program/financing variant relative to an "otherwise" similar unsubsidized FHA development. One should note that only nine program variants have been included in this analysis, since we have excluded substantial rehabilitation from this component of the research.

Figure 5-1 displays the estimated cost differential for each program/financing variant, with the shaded areas in the chart signifying statistically significant effects.[5] As the figure readily illustrates, there are significant differences in per unit improvement costs across the different program/financing variants, even controlling for other factors that might influence construction costs. Only two program variants are insignificant: 11(b)s and Section 236 Rent Supplement; the remaining program types display fairly substantial cost differentials, with both Section 8 and Public Housing registering expenditures that are higher than otherwise similar unsubsidized FHA developments.

It is also apparent from Figure 5-1 that unit improvement costs vary both within and between the major program types. Within Section 8, costs appear to be lowest for HUD-processed FHA projects, and highest for 202s. However, all variants of Section 8 are relatively inexpensive when compared to Public Housing. In general, Public Housing projects are about 39 to 55 percent more expensive than otherwise similar unsubsidized housing. Although the analysis also suggests that turnkey pro-

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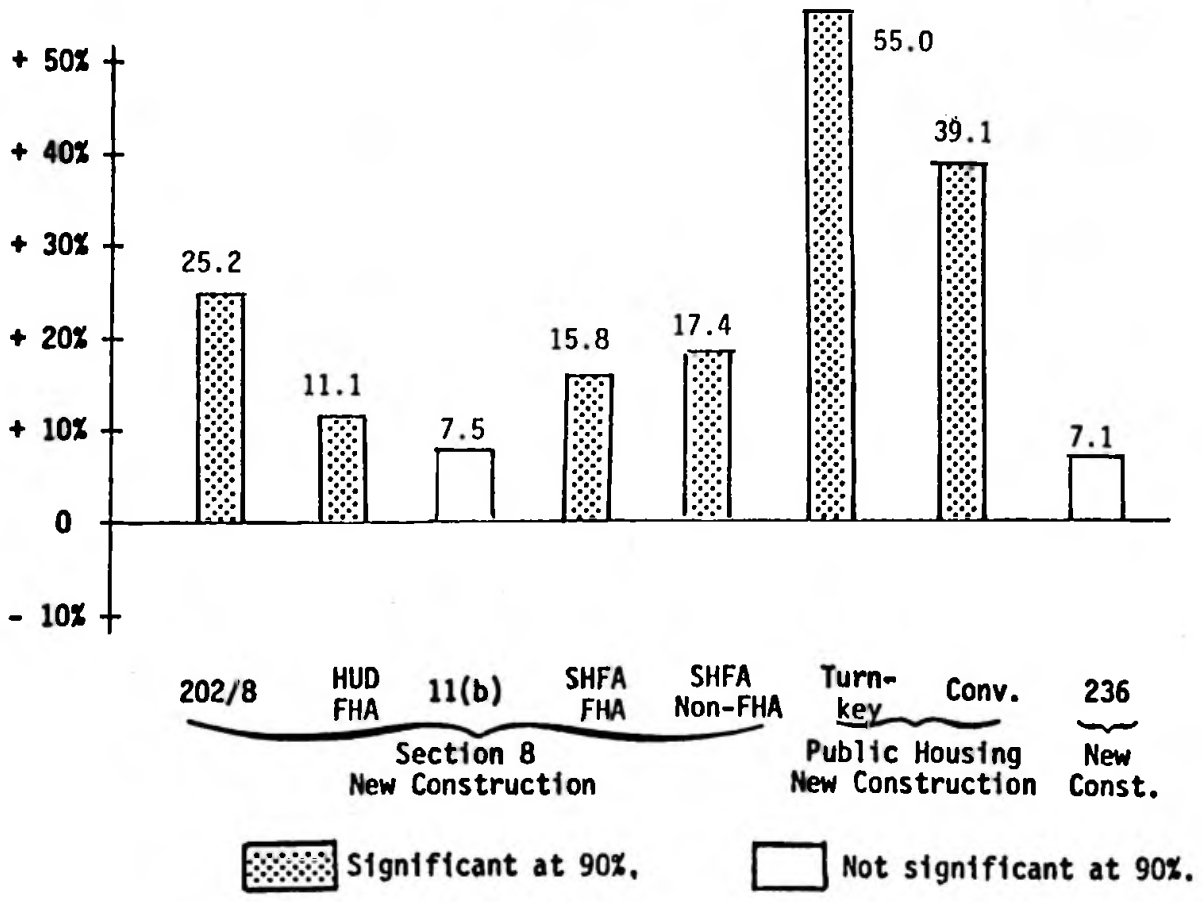
[5]Again, the percentage markup is defined as

$$\frac{C/D_i}{C_o} = e^{a_i} - 1$$

where a_i is the coefficient of the program dummy, D_i, and C_o is improvement costs of an otherwise similar unsubsidized FHA unit.

Figure 5-1

ESTIMATED IMPROVEMENT COST DIFFERENTIAL RELATIVE TO UNSUBSIDIZED 221(d)4
Newly Constructed Projects



jects are more expensive than conventional ones, this differential most likely reflects a tendency for the improvement data of turnkey projects to contain a higher proportion of soft development costs.[6]

The cost differentials displayed in Figure 5-1 undoubtedly reflect a host of complex factors. While it is difficult to quantify the relative importance of these factors, one can identify several key program elements that may contribute to program markups. A detailed examination of these factors is presented in Chapter 6. However, at this point, it may be instructive to enumerate some of the more obvious explanations for the differentials that are observed.

One possible source of the relatively high costs of Section 202/8 and Public Housing is their more cumbersome processing requirements. We tried to quantify such requirements by including several variables that measured the developer's estimate of processing time, as well as his assessment of the overall efficiency and helpfulness of the processing agency; these variables were insignificant and did not affect the estimated program markups. However, such measures are admittedly crude proxies for the level of effort required to move a project through an agency's processing cycle. As a result, a large part of the estimated program markups could well reflect differences in the processing requirements of the different programs.

Program differentials may also reflect subtle design differences that may contribute to the quality of life but lead to an increase in improvements costs; such differences could well underlie the estimated cost differential between HUD and SHFA-processed Section 8. Cost differentials may also reflect variations in the underlying quality or "durability" of construction. From this perspective, it is interesting to note

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[6]See Chapter 3 for a discussion of this issue.

that the program variants with the deepest capital subsidies -- namely, Section 202/8 and Public Housing -- have the largest overall markups. Such a pattern is consistent with economic models of investor behavior, in which producers respond to capital subsidies by spending more up-front in order to realize subsequent savings in operating costs.

But whatever the precise source of the differentials, one thing is relatively clear: most of the program and financing variants that have been included in our analysis have very different bricks-and-mortar costs than unsubsidized FHA projects which are similar in terms of size, structure type, composition of units, and type of sponsor. Either the different housing programs are demanding -- or encouraging -- very different standards of design and construction, or the various processing requirements of the programs have lead to higher construction costs. The net result is much the same: higher improvement costs than would be observed on the private market.

5.1.2 Land and Offsite Costs: New Construction

The previous section examined differences in per unit improvement costs for newly constructed projects. This section estimates a regression equation for the other "hard" components of development costs: land and offsite costs. Such costs are combined in the analysis on the assumption that the need for offsite expenditures will be reflected in the parcel's market value, with higher offsite costs generally associated with less expensive land.[7]

Table 5-2 presents the results of the regression analysis. The dependent variable is the sum of per unit land and offsite costs, where costs are expressed in logarithmic terms

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[7]Supplemental regressions of per unit land costs on per unit offsite costs (along with the other variables displayed in Table 5-3) indicated that a hundred dollars expended in per unit offsite costs was associated with an 8 percent decrease in the recognized value of the land.

and corrected for price variations across cities and over time.[8] The independent variables include: (1) the amount of land per unit; (2) overall parcel size; (3) two variables measuring the developer's rating of the project's neighborhood; (4) a dummy variable indicating a for-profit sponsor; and (5) the basic set of eight program/financing variants for newly constructed projects. Note that the land cost variable appearing in the regression equation has already been adjusted by our Land Price Index. As a result, the regression omits the basic factors that were used to construct this index, including region, date of construction, size of place, and central city location.[9]

Overall, the estimated regression equation explained about 12 percent of the observed variation in per unit land and off-site costs. Such variation appears to reflect differences in both the amount and the price of land. Not too surprisingly, land costs increased with increases in the amount of land per dwelling unit. However, they also increased with increases in neighborhood quality, and with decreases in the overall parcel size. This latter relationship most likely reflects discounts that are associated with larger tracts of land. The estimated regression parameters also indicate that land costs are higher for profit-motivated developers, a pattern that probably reflects a tendency among non-profits to develop projects on donated land. Indeed, about 5 percent of the projects developed by non-profits did not have any costs associated with the land.

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[8]Offsite costs have been adjusted using the Dodge Construction Index, while land costs are adjusted with the Land Price Index described in Chapter 3.

[9]See Appendix H for a detailed discussion of the Land Price Index.

Table 5-2

REGRESSION OF PER UNIT LAND PLUS OFFSITE COSTS:
New Construction Only
(Semi-log)

INDEPENDENT VARIABLES	Regression Coefficient (β)	Standard Error (σ)	Mean of Independent Variable
CONSTANT	.1455		
AVERAGE LAND/UNIT (1,000s square feet)	.0953[a]	.0300	2.96
TOTAL AMOUNT OF LAND (10,000s square feet)	-.0054[c]	.0000	24.73
NEIGHBORHOOD RATING			
1. Overall Quality[1]	.1319[c]	.0683	4.094
2. Rate of Appreciation[2]	.2312[b]	.1160	3.116
FOR-PROFIT SPONSOR (Yes=1/No=0)	.8152[a]	.2398	.722
PROGRAM DUMMIES			
1. Section 8 New Construction			
a. 202	.2813	.3423	.081
b. HUD FHA	-.0634	.1956	.189
c. 11-b FHA	-.2556	.3900	.027
d. State FHA	.1430	.2310	.109
e. State Non-FHA	-.3251[d]	.1990	.185
2. Public Housing New Construction			
a. Turnkey	1.3061[a]	.3747	.058
b. Conventional	.9448[b]	.3811	.056
3. 236 Rent Supplement	-.1786	.2451	.10?
R^2 = .126 F = 4.33 Standard Error = 1.186 Sample Size = 712			

[a]Significant at 99 percent.
[b]Significant at 95 percent.
[c]Significant at 90 percent.
[d]Significant at 85 percent.

[1]Developers rated the project's neighborhood at the time of development on a scale from 1 to 5, where 1 = blighted, 2 = deteriorated, 3 = beginning to deteriorate, 4 = average, 5 = above average.

[2]Developers were asked how property values in the project's neighborhood had changed relative to the rest of the market in the past three years, where 1 = declined, 2 = remained stagnant, 3 = risen at about the same rate, 4 = risen more rapidly than the rest of the market.

The major focus of this analysis is again on the different program/financing variants, where the base case for comparison is an unsubsidized FHA project. Unlike improvement costs, per unit land and offsite costs show relatively little variation over most of the different program types. Only three dummies are significant: one for uninsured SHFA projects, and two for traditional Public Housing. However, for these three program variants, the differentials are relatively high.

In general, Public Housing tends to have land costs that are about twice as high as similarly located unsubsidized projects. However, since such costs for Public Housing will include any expenditure that is associated with the acquisition of the site -- as opposed to its market, or mortgagable value -- interpretation of these differentials is problematic. In contrast to Public Housing, uninsured SHFA projects tend to have relatively low land and offsite costs in comparison to unsubsidized units. This differential may simply reflect more stringent underwriting standards on the part of SHFAs; alternatively, they may derive from additional locational differences not captured by the regression equation.

5.1.3 Combined Land, Offsite and Improvement Costs: New Construction and Substantial Rehabilitation

Up until now, the regression analysis has focused on new construction in order to derive separate estimates of program impact for land and improvement costs. However, in order to make comparisons of the relative costs of new construction vis-a-vis substantial rehabilitation, we combined these individual cost components into an overall measure of "hard" development costs. The results of this analysis are presented in Table 5-3, where the dependent variable is the sum of per unit land, improvements and offsite costs. Once again, all costs are adjusted for price variations across time and place, and are expressed in logarithmic terms.

Table 5-3

REGRESSION OF COMBINED LAND, OFFSITE, AND IMPROVEMENT COSTS PER UNIT:
New Construction and Substantial Rehabilitation
(Semi-log)

INDEPENDENT VARIABLES	Regression Coefficient (β)	Standard Error (σ)	Mean of Independent Variable
CONSTANT	2.9000		
PROJECT CHARACTERISTICS			
1. Elderly (Yes=1/No=0)	-.0160	.0321	.461
2. Project Size			
a. 50- 99 Units (Yes=1/No=0)	.0556[b]	.0278	.348
b. 100-149 Units (Yes=1/No=0)	.0491	.0360	.243
c. 150 or More Units (Yes=1/No=0)	.0479	.0491	.177
3. Average Number of Stories	.0222[a]	.0046	3.574
4. Structure Type			
a. Row/Walkup (Yes=1/No=0)	.0050	.0357	.315
b. Elevator (Yes=1/No=0)	.0625[d]	.0434	.361
c. Mixed (Yes=1/No=0)	.0259	.0389	.225
5. Average Land/Unit (1,000s square feet)	.0158[b]	.0100	2.717
6. Exterior Finish			
a. Durable (Yes=1/No=0)	.0401	.0288	.389
b. Mixed Durable (Yes=1/No=0)	-.0134	.0295	.267
c. Wood (Yes=1/No=0)	.0132	.0327	.177
7. Proportion Residential	-.4860[a]	.1055	.795
UNIT CHARACTERISTICS			
1. Average Size (1,000s square feet)	.4337[a]	.1133	.694
2. Distribution of Bedrooms			
a. Percent One Bedroom	.1501[b]	.0680	.577
b. Percent Two Bedroom	.2268[b]	.0929	.260
c. Percent Three Bedroom	.2494[b]	.1159	.098
d. Percent Four or More Bedroom	.4321[b]	.2058	.017
3. Distribution of Bathrooms			
a. Percent One-and-One-Half Bathrooms	.0613	.0551	.077
b. Percent Two or More Bathrooms	-.0549	.0987	.033
4. Amenities and Equipment			
a. Index of Unit Amenities	-.0004	.0076	4.712
b. Index of Project Amenities	.0103	.0109	1.956
SPONSOR CHARACTERISTICS			
1. Type			
a. For-Profit (Yes=1/No=0)	-.0154	.0473	.738
b. Syndicated (Yes=1/No=0)	-.0358	.0275	.405
2. Number of Employees	.0001	.0000	82.409
3. Units Previously Developed (1,000s)	-.0037	.0000	1.254
BUILDER'S PROFIT INCLUDED (Yes=1/No=0)	.0205	.0497	.107
LOCATIONAL VARIABLES			
1. Total Amount of Land (10,000s square feet)	-.0005	.0000	22.714
2. Neighborhood Rating			
a. Overall Quality	.0145	.0103	4.010
b. Rate of Appreciation	-.0009	.0171	3.109
EXTENT OF REHABILITATION[1]	1.0837[a]	.1329	.084
PROGRAM DUMMIES			
1. Section 8 New Construction			
a. 202/8	.2364[a]	.0649	.072
b. HUD FHA	.0952[b]	.0441	.169
c. 11-b FHA	.0447	.0767	.024
d. State FHA	.1428[a]	.0508	.097
e. State Non-FHA	.1494[a]	.0461	.165
2. Section 8 Substantial Rehab			
a. HUD FHA	-.9013[a]	.1148	.070
b. State FHA	-.8852[a]	.1289	.016
c. State Non-FHA	-.7432[a]	.1311	.024
3. Public Housing New Construction			
1. Turnkey	.4805[a]	.0712	.051
2. Conventional	.4015[a]	.0752	.050
4. 236 Rent Supplement	.0713	.0536	.096
R^2 = .589 F = 12.89 Standard Error = .182 Sample Size = 800			

[a]Significant at 99 percent.
[b]Significant at 95 percent.
[c]Significant at 90 percent.
[d]Significant at 85 percent.

[1]Extent of rehabilitation = 0 for new construction. For substantial rehabilitation it is the ratio of improvement costs to total hard development costs (i.e., improvement costs, land costs and offsite costs).

The independent variables that appear in Table 5-3 were for the most part drawn from our two previous regressions of land and improvement costs. Since the estimated impact of these variables is much the same in this equation, they will not be considered here. Suffice it to say that the major patterns that were observed in the separate analyses of land and improvements generally prevailed when the two components of costs were combined and when the sample was expanded to include some 88 additional rehabilitated projects.

To allow for the addition of renovated projects -- as well as to test for differences among three additional program types -- four variables not appearing in previous regressions were included in this analysis. Three were dummy variables signifying various kinds of substantial rehabilitation, including: (1) HUD-processed FHA; (2) SHFA-processed FHA; and (3) SHFA-processed uninsured. The fourth variable was defined only for renovated projects, and represents the ratio of improvement costs to total "hard" development costs. This variable proxied the overall extent or intensity of rehabilitation, with values close to one indicating that the renovation was essentially "gut." For newly constructed projects, the variable was set to zero.

In order to evaluate the relative efficiency of any of the rehabilitation programs considered in this analysis vis-a-vis unsubsidized new construction, one must evaluate the following term:

$$a_{ir} = a_i + bR_j$$

where a_i is the estimated coefficient of the program dummy, P_i, and R_j is the project's ratio of improvements to total hard development costs.[10] As can be seen in Table 5-3,

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[10]Since $R_j = 0$ for newly constructed projects, the impact of the other program/financing variants continues to be represented by the simple coefficients of their respective dummy variables.

the coefficients of the rehabilitation dummies are always negative, but have absolute values that are small when compared to the positive coefficient of R. This pattern implies that new construction for the lower levels of renovation. However, as the ratio of improvements to total "hard" development costs gets relatively large (i.e., 80 percent or more), any economies disappear and are replaced by a positive cost differential.[11]

Figure 5-2 displays the estimated percentage cost differentials implied by the regression equation for each of our twelve basic program/financing variants. In deriving these differentials, rehabilitation programs are evaluated at their average (weighted) value of "R," which was about 76 percent for HUD FHA projects, 79 percent for state FHA, and 82 percent for SHFA projects that were uninsured. As is evident from the chart, the high proportion of gut rehabilitations in this latter program type produced a positive cost differential vis-a-vis unsubsidized new construction, while the other kinds of rehabilitation were about 3 to 8 percent less expensive. The remaining differentials associated with program type are almost identical to those derived in the analysis of improvement costs. This consistency is not surprising, since improvements represent about 92 percent of a new project's "hard" development costs.

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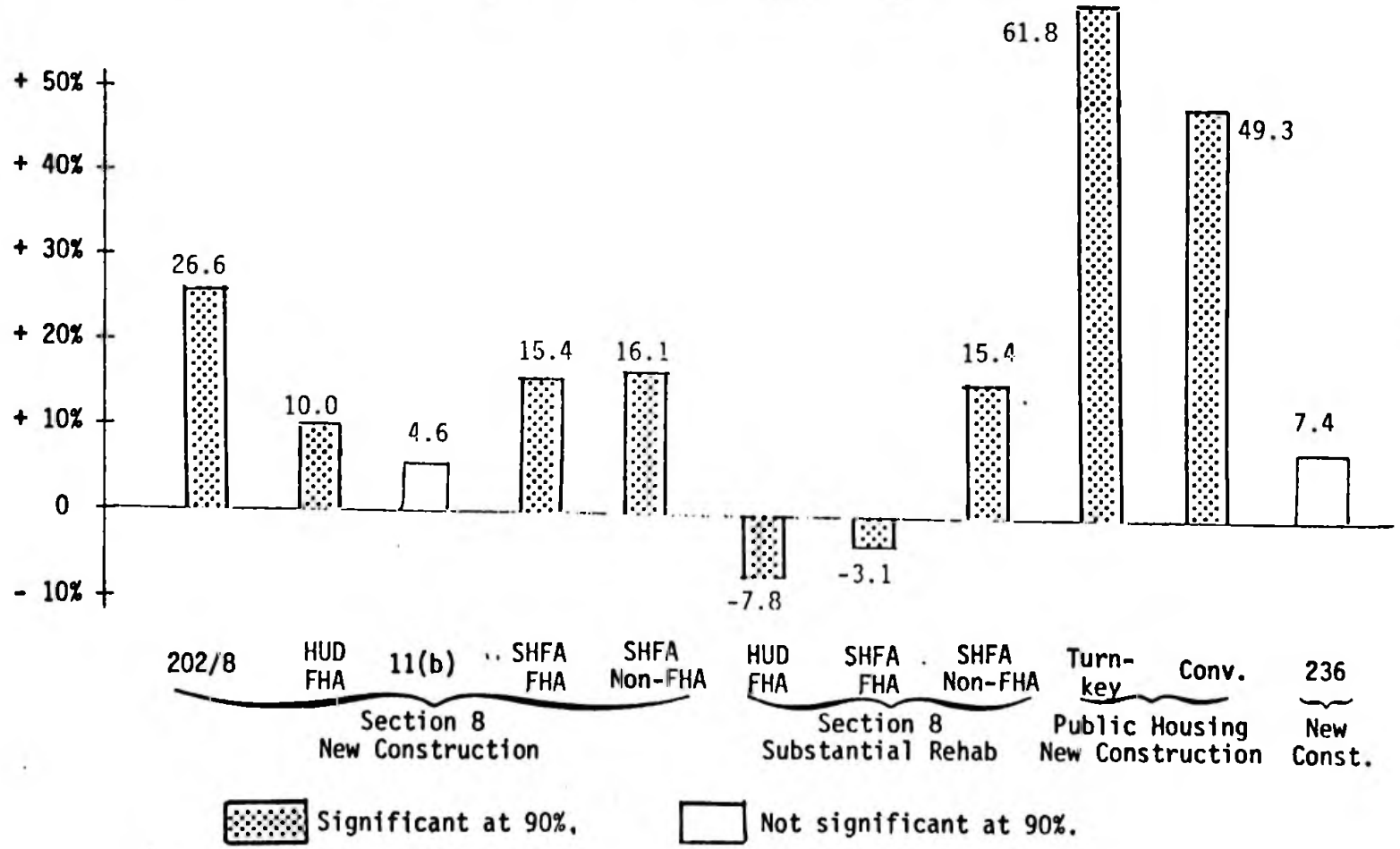
[11]The breakeven point for the various rehabilitation programs can be found by solving for "R" in the following equation:

$$a_{ir} = a_i + bR = 0 \quad \text{or} \quad R = -a_i/b$$

This point occurs at R = .83 for HUD processed Section 8; R = .82 for SHFA insured projects; and R = .69 for uninsured SHFA.

Figure 5-2

ESTIMATED DIFFERENTIALS IN PER UNIT LAND, OFFSITE, AND IMPROVEMENT COSTS
New Construction and Substantial Rehabilitation



5.2 Construction Period Carrying Costs: New Construction and Substantial Rehabilitation

In general, the soft components of development costs are proportional to improvements, with their relative magnitude determined by the particular program's regulations and administrative fees. As a result, regression analysis was not attempted for most of these cost components. However, in the case of carrying charges, it was possible to identify factors other than program/financing variant that could have an impact on these costs.

Table 5-4 presents the results of a regression equation that relates a project's construction period carrying charges to a number of different variables, including: (1) per unit improvement costs; (2) per unit land and offsite costs; (3) the length of the construction period; (4) the year that construction began; (5) the location of the site (central city versus suburban or non-metropolitan); (6) the developer's assessment of neighborhood quality; and (7) the basic set of 12 program/financing variant dummies. Per unit carrying costs include the sum of expenditures on construction period interest, insurance, and property taxes. As with previous regressions, the dependent variable has been corrected with the Dodge Construction Index, and is expressed in logarithmic terms.

Per unit land and improvement costs were included in the regression to reflect the fact that carrying charges are primarily governed by these variables. Interest payments during construction will depend directly on the total amount of improvements, while taxes and insurance payments may be more related to the value of the land. It is obvious from Table 5-4 that both variables have a substantial impact on a project's per unit carrying costs. The length of the construction period also affects such expenditures, with longer periods associated with significantly higher costs. Again, the reasons for this relationship are obvious, and stem from the very nature of carrying charges.

Table 5-4

REGRESSION OF CARRYING CHARGES PER UNIT:
New Construction and Substantial Rehabilitation
(Semi-log)

INDEPENDENT VARIABLES	Regression Coefficient (β)	Standard Error (σ)	Mean of Independent Variable
CONSTANT	-1.1710		
IMPROVEMENT COSTS/UNIT ($1,000s)	.0264[a]	.0058	24.963
LAND COSTS/UNIT ($1,000s)	.0629[a]	.0196	2.028
LENGTH OF CONSTRUCTION PERIOD (MONTHS)	.0357[a]	.0062	14.120
YEAR CONSTRUCTION BEGAN[1]	.0179	.0318	7.427
LOCATION[2]			
1. Central City (Yes=1/No=0)	.0889	.0885	.390
2. Suburb (Yes=1/No=0)	.1032	.0945	.256
NEIGHBORHOOD RATING			
1. Overall Quality	-.0460	.0381	4.033
2. Rate of Appreciation	.0303	.0623	3.112
PROGRAM DUMMIES			
1. Section 8 New Construction			
a. 202/8	-.1499	.1611	.073
b. HUD FHA	-.0831	.1221	.171
c. 11-b FHA	-.1406	.2434	.024
d. State FHA	-.2435[c]	.1440	.099
e. State Non-FHA	-.2697[b]	.1250	.167
2. Section 8 Substantial Rehab			
a. HUD FHA	.1863	.1773	.071
b. State FHA	.1233	.2826	.017
c. State Non-FHA	-.3942[c]	.2310	.024
3. Public Housing New Construction			
a. Turnkey	-1.7404[a]	.2089	.041
b. Conventional	-.5366[a]	.1980	.048
4. 236 Rent Supplement	.0282	.1831	.098
R^2 = .257 F = 7.87 Standard Error = .714 Sample Size = 790			

[a]Significant at 99 percent. [c]Significant at 90 percent.
[b]Significant at 95 percent. [d]Significant at 85 percent.

[1]The year construction began ranges from 1 for projects started in 1971 to 9 for projects started in 1979.

[2]The base case for location is "non-metropolitan areas." The location categories "central city" and "suburb" both refer to locations within SMSAs.

The rationale underlying the inclusion of the other variables is perhaps less obvious. The geographic variables measuring central city locations and the developer's perception of neighborhood quality were included in the equation to allow for differences in interest, tax, and insurance rates in particular kinds of locations. However, as is evident from Table 5-4, such variables proved insignficant. The project's construction date was included to allow for a secular increase in construction period interest rates. Again, no such trend is evident from our data -- or, alternatively -- any differences that did arise were already captured by the Dodge Construction Index.

Examining the estimated coefficients of the program dummies, it is evident that per unit carrying charges are fairly constant among the HUD-processed program variants, including both subsidized and unsubsidized FHA projects, and new construction and substantial rehabilitation. However, carrying charges did tend to be low for all types of SHFA-processed projects, reflecting more favorable rates on construction loans that are available from such agencies. Carrying charges were also relatively low for Public Housing. While this pattern is understandable for conventional units, the differentials observed for turnkey units -- which obtain financing on the private market -- are somewhat suspect. Indeed, the low rates observed for turnkey housing most likely reflect a problem with available data, since only 16 of the 55 turnkey projects recorded expenditures in this category.

5.3 Total Development Costs: New Construction and Substantial Rehabilitation

This section combines the various factors that were shown to have an impact on the individual components of development costs and estimates their net influence on a project's total

costs. As we have seen, the effects of some of these variables may vary across the different components of development costs. For example, projects developed by profit-motivated firms tend to have lower improvement costs than those developed by non-profits. However, their land costs are typically higher and development costs will include a BSPRA. Similar "conflicting" patterns arise among the different program variants. For example, while we have found that uninsured SHFA projects tend to spend more on improvement costs, their carrying charges and processing fees are typically lower. By combining the various components of development costs into one overall regression equation, our analysis will serve to estimate the net effects of such conflicting pressures on a project's costs.

Table 5-5 presents the results of our regression analysis for Total Development Costs, where the dependent variable is again expressed in logarithmic terms and where all costs are adjusted for inter-regional and inter-temporal price variations. In all, some 46 different variables have been included in the equation, representing the set of relevant factors shown to influence development costs. The combined variables account for about 53 percent of the observed variation in total costs; and most of the variables that were significant in earlier equations retain their significance here. One interesting pattern that does emerge is related to the impact of developer type. While the "profit-motivated" and "syndicated" dummies help to explain differentials occurring among the individual components of costs, their impact on total costs appears to be negligible. As suggested above, this pattern probably reflects the "netting-out" of conflicting tendencies on a project's costs.

It is also interesting to note that none of the locational and neighborhood variables are significant in the regression equation. Although these factors were shown to have an impact on the cost of land, their impact on total development costs is found to be negligible. This finding tends to refute a frequently stated claim that building in inner-city neighborhoods is significantly more expensive than construction

Table 5-5

REGRESSION OF TOTAL DEVELOPMENT COSTS PER UNIT:
New Construction and Substantial Rehabilitation
(Semi-log)

INDEPENDENT VARIABLES	Regression Coefficient (β)	Standard Error (σ)	Mean of Independent Variable
CONSTANT	3.1885	N/A	N/A
PROJECT CHARACTERISTICS			
1. Elderly (Yes=1/No=0)	-.0173	.0320	.461
2. Project Size			
a. 50- 99 Units (Yes=1/No=0)	.0482[c]	.0279	.348
b. 100-149 Units (Yes=1/No=0)	.0543[d]	.0363	.243
c. 150 or More Units (Yes=1/No=0)	.0623	.0497	.177
3. Average Number of Stories	.0185[a]	.0047	3.574
4. Structure Type			
a. Row/Walkup (Yes=1/No=0)	-.0231	.0357	.315
b. Elevator (Yes=1/No=0)	.0483	.0433	.361
c. Mixed (Yes=1/No=0)	.0032	.0390	.225
5. Average Land/Unit (1,000s square feet)	.0150[b]	.0100	2.747
6. Exterior Finish			
a. Durable (Yes=1/No=0)	.0381	.0287	.389
b. Mixed Durable (Yes=1/No=0)	-.0081	.0294	.267
c. Wood (Yes=1/No=0)	.0019	.0327	.177
7. Proportion Residential	-.4719[a]	.1055	.795
UNIT CHARACTERISTICS			
1. Average Size (1,000s square feet)	.4258[a]	.1131	.694
2. Distribution of Bedrooms			
a. Percent One Bedroom	.1710[b]	.0677	.577
b. Percent Two Bedroom	.2380[a]	.0924	.260
c. Percent Three Bedroom	.2663[b]	.1156	.098
d. Percent Four or More Bedroom	.4189[b]	.2054	.017
3. Distribution of Bathrooms			
a. Percent One-and-One-Half Bathrooms	.0695	.0552	.077
b. Percent Two or More Bathrooms	.0188	.0991	.033
4. Amenities and Equipment			
a. Index of Unit Amenities	-.0054	.0076	4.711
b. Index of Project Amenities	.0062	.0108	1.956

Table 5-5 (Continued)

INDEPENDENT VARIABLES	Regression Coefficient (β)	Standard Error (σ)	Mean of Independent Variable
SPONSOR CHARACTERISTICS			
1. Type			
a. For-Profit (Yes=1/No=0)	-.0081	.0471	.738
b. Syndicated (Yes=1/No=0)	-.0014	.0275	.405
2. Number of Employees	.0001	.0001	82.409
3. Units Previously Developed (1,000s)	-.0029	.0000	1.254
LOCATIONAL VARIABLES			
1. Total Amount of Land (10,000s square feet)	-.0007	.0000	22.714
2. Neighborhood Rating			
a. Overall Quality	.0135	.0103	4.010
b. Rate of Appreciation	.0003	.0170	3.109
3. Accessibility			
a. Central City (Yes=1/No=0)	-.0035	.0245	.393
b. Suburban (Yes=1/No=0)	.0368	.0258	.254
LENGTH OF CONSTRUCTION PERIOD	.0041[b]	.0017	14.185
YEAR CONSTRUCTION BEGAN	-.0121	.0085	7.396
EXTENT OF REHABILITATION	1.0447[a]	.1331	.084
PROGRAM DUMMIES			
1. Section 8 New Construction			
a. 202/8	.1558[b]	.0666	.072
b. HUD FHA	.0830[c]	.0453	.169
c. 11-b FHA	.0273	.0794	.024
d. State FHA	.1001[c]	.0522	.097
e. State Non-FHA	.0653	.0475	.165
2. Section 8 Substantial Rehab			
a. HUD FHA	-.8479[a]	.1152	.070
b. State FHA	-.8546[a]	.1288	.016
c. State Non-FHA	-.7705[a]	.1308	.024
3. Public Housing New Construction			
a. Turnkey	.3004[a]	.0715	.051
2. Conventional	.2704[a]	.0757	.050
4. 236 Rent Supplement	-.0108	.0603	.096
R^2 = .531 F = 9.20 Standard Error = .181 Sample Size = 800			

[a]Significant at 99 percent.
[b]Significant at 95 percent.
[c]Significant at 90 percent.
[d]Significant at 85 percent.

in suburban or rural areas.

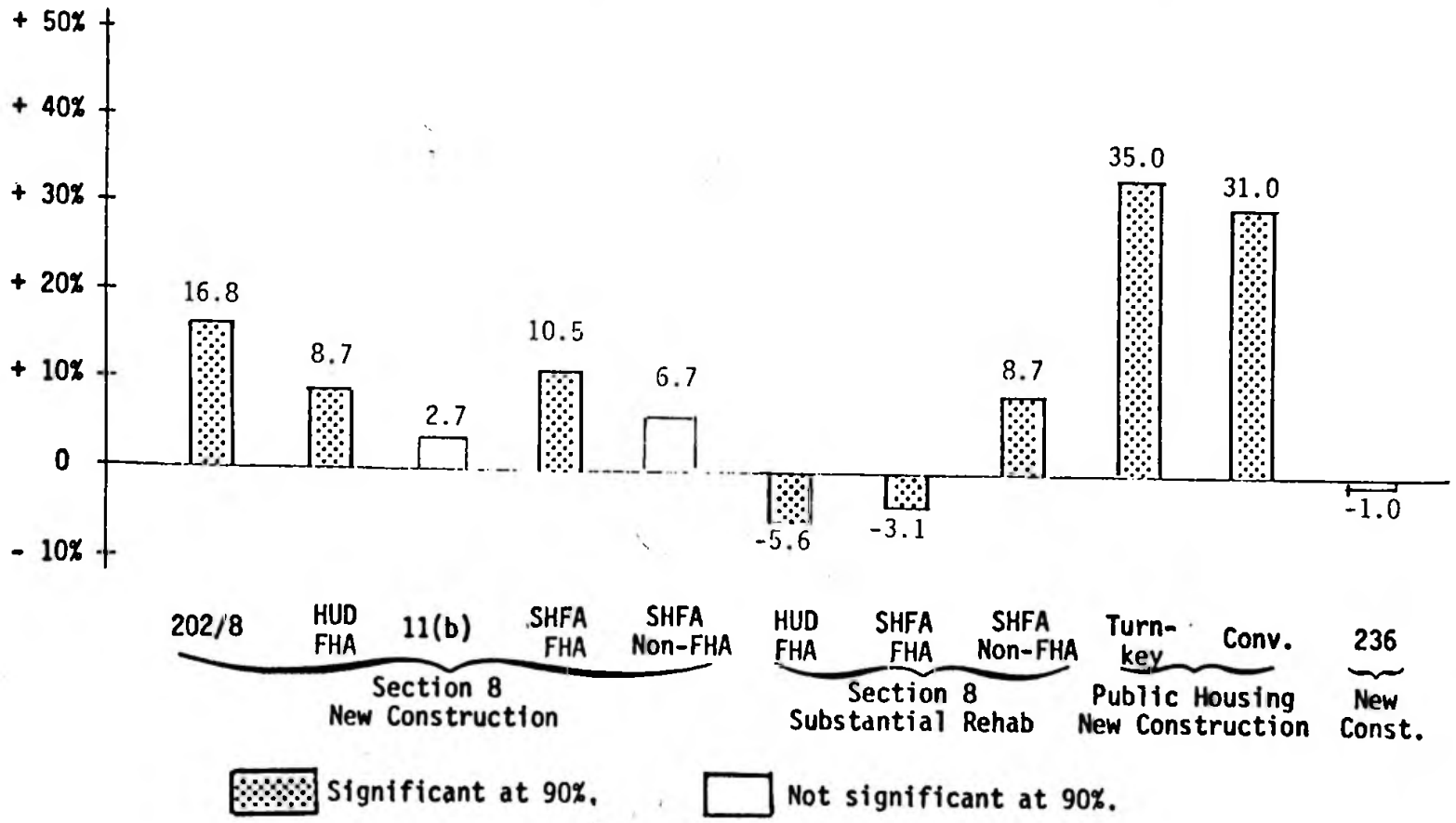
The estimated program differentials in total development costs are presented graphically in Figure 5-3. As before, we have evaluated the differentials that are associated with substantial rehabilitation by using the average "intensity" or extent of renovation for each program type. In all, 8 of the 11 subsidized program variants display total per unit costs that are statistically different from the costs of an otherwise similar unsubsidized FHA project. Dummy variables representing 11(b) and Section 236 Rent Supplement projects again prove insignificant. In addition, the differential previously noted for uninsured SHFA new construction is cut in half, and is not statistically different from zero. Apparently, the lower soft costs associated with such projects -- including their lower carrying charges -- are large enough to offset their higher expenditures on improvements.

In general, the relative ranking of the remaining programs' costs are fairly similar to those observed in our previous analysis of "hard" development costs. However, in most instances, the overall magnitude of the differentials have declined. For example, the "hard" development costs of Public Housing tend to be about 40 to 50 percent higher than otherwise similar HUD-processed Section 8 projects, and some 50 to 60 percent higher than unsubsidized FHA; however, once soft costs are considered -- which tend to be lower for Public Housing -- the estimated difference vis-a-vis Section 8 and unsubsidized FHA falls to about 24 and 33 points, respectively. Much the same effect is observed for the relative costs of 202/8 and HUD-processed Section 8. While there is about a 17 percent differential in their hard components of development costs, this difference is cut in half once the "soft" components of costs are considered.

But despite these shifts in the relative magnitude of the estimated cost differentials, the basic patterns remain. Most of the major program variants relying on new construction tend to have significantly higher total development costs than "otherwise similar" unsubsidized FHA. However, rehabilitated

Figure 5-3

ESTIMATED PROGRAM DIFFERENTIALS IN TOTAL DEVELOPMENT COSTS PER UNIT
New Construction and Substantial Rehabilitation



projects are again shown to have costs that compare favorably to unsubsidized developed new construction, at least for lower levels of renovation. Indeed, the total costs of HUD-insured rehabilitation projects tend to be about 3 to 6 percent lower than the costs of unsubsidized FHA.

Among the housing subsidy programs that utilize new construction, Section 236 appears to be least expensive, both in terms of "hard" and "total" per unit development costs. While uninsured SHFA projects have total costs that compare favorably to the private sector, this similarity is largely the result of their lower processing and financing costs. In contrast, HUD-processed Section 8 tends to have total development costs that are about 9 percent higher than unsubsidized FHA. Given the similarity in the soft components of development costs for such developments, this markup primarily reflects the 10 percent differential that was observed in improvement costs. Again, the most expensive variant of Section 8 housing appears to be Section 202/8, which displays an overall markup in total costs of approximately 17 percent.

But by far the largest differentials are associated with Public Housing. The total development costs of turnkey and conventional housing appear to be roughly similar, a finding which suggests that earlier differences were largely associated with the difficulty of allocating expenditures for turnkey projects. Both program variants appear to have costs that are about 31 to 35 percent higher than unsubsidized housing. Even given the problems that are associated with deriving comparable measures of development costs, these differentials are fairly startling and suggest relatively large cost differentials among the major program types.

5.4 Composition of Average Per Unit Cost Differentials

The regression analysis presented in this chapter enabled us to estimate the relative costs of producing an identical project under the different program and financing variants. This section addresses the issue of program costs from a

somewhat different perspective. In particular, we ask the following question: how much of the observed variation in the average unit costs of unsubsidized and subsidized housing is attributed to differences in the characteristics of the units produced, and how much is simply due to the relative efficiency (or inefficiency) of the different program variants?

To answer this question, we first returned to our earlier analysis of "hard" development costs, and examined variations in the underlying value of land and structures that are suggested by the estimated regression equation (Table 5-3). The results of this analysis are presented in Table 5-6. The first column of the chart presents average per unit land, improvement and offsite costs for each of the thirteen program variants, weighted to reflect their underlying population means. The next column in the chart represents the difference between the average cost of each subsidized program variant and the average cost of an unsubsidized FHA unit ($23,721). As is evident from the chart, most program variants had average hard costs that were significantly higher than the average costs of unsubsidized housing. However, three program variants -- 11(b) and the two types of FHA insured rehabilitation -- had cost differentials that were insignificant at a 90 percent confidence interval.

The remaining columns in the chart attempt to decompose these average cost differentials into two major elements: (1) the differentials that are associated with differences in the characteristics and locations of the projects developed; and (2) the differentials that are associated with the program itself. Such breakdowns were derived by using the program markups that were estimated in our regression analysis of hard development costs (Figure 5-2), combined with information on average per unit costs (Column 1).

For example, suppose that "X_i" is the value of the average unit constructed under program "i," evaluated at the "hard" costs that would have occurred if the unit had been unsubsidized FHA. Suppose also that a_i is the program's

Table 5-6

BREAKDOWN OF OBSERVED DIFFERENCES IN PER UNIT LAND, IMPROVEMENT, AND OFFSITE COSTS:[a] SUBSIDIZED HOUSING VERSUS UNSUBSIDIZED FHA

	Average Per Unit Hard Development Costs[a]	Average Difference in Per Unit Hard Costs Relative to Unsubsidized FHA	Composition of Hard Cost Differential	
			Project Characteristics	Program/ Financing Type
SECTION 8				
NEW CONSTRUCTION				
202	$29,803	+ $ 6,082	- 183	+ 6,265
HUD FHA	24,969	+ 1,248	-1,015	+ 2,263
11(b) Insured	25,596	+ 1,875[b]	+ 749[c]	+ 1,126[c]
SHFA FHA	25,796	+ 2,075	-1,362	+ 3,437
SHFA Uninsured	26,634	+ 2,913	- 774	+ 3,687
SUBSTANTIAL REHABILITATION				
HUD FHA	24,454	+ 733[b]	+ 2,796	- 2,063
SHFA FHA	24,318	+ 597[b]	+ 1,363	- 766
SHFA Uninsured	31,705	+ 7,984	+ 3,759	+ 4,225
PUBLIC HOUSING				
Turnkey	38,351	+ 14,630	- 14	+ 14,644
Conventional	38,472	+ 14,751	+ 2,042	+ 12,709
236 RENT SUPPLEMENT	26,212	+ 2,491	+ 694	+ 1,797[c]
UNSUBSIDIZED 221(d)4	23,721	N/A	N/A	N/A

[a]All Cost Data are weighted to reflect population means.

[b]Difference in means was not significantly different from zero with a 90 percent confidence interval.

[c]Coefficient used to calculate differential was not significantly different from zero with a 90 percent confidence interval.

percentage markup vis-a-vis an "otherwise similar" unsubsidized unit,[12] and that C_i is the program's average per unit cost. We know that a unit costing "X" under unsubsidized FHA would cost "$X + a_iX$" under Program i. Thus, it must be true that:

$$C_i = X_i + a_iX_i$$

or

$$X_i = C_i/(1 + a_i)$$

The difference in costs attributed to project characteristics (including site) is simply the difference between X_i and the average cost of an unsubsidized FHA unit ($23,721). The difference in costs that is associated with program type is "a_iX_i," or the dollar value of the program's markup vis-a-vis unsubsidized FHA costs. Note that the sum of these two differentials is equal to the difference between the average costs of Program "i" and unsubsidized FHA units (Column 2).

A specific example may help to clarify the derivations described above. From Table 5-6, we know that the average Section 202 project had hard development costs of about $29,803 per unit. We also know that such costs for a Section 202 project are about 26.6 percent higher than the costs of an otherwise similar FHA project (Figure 5-2). Working backwards from average costs, it appears that Section 202s would be worth about $23,537 ($29,803/1.266) when evaluated in terms of

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[12]Note that $a_i = (e - 1)$, where a_i is the coefficient of the dummy variable.

unsubsidized FHA costs, and that an additional $6,265 (26.6 percent of $23,537) was expended as a result of underlying differences in program costs. Thus, the implicit value of the units that were produced under Section 202 ($23,537) is some $183 less than the units produced in the unsubsidized housing market ($23,721). However, since it costs an additional $6,265 to construct these units, the average costs of Section 202 projects are actually some $6,082 higher ($6,265 - $183) than those observed for unsubsidized FHA.

The figures presented in Table 5-6 reveal some fairly striking patterns. To begin with, the Section 236 Rent Supplement program appears to have produced marginally more expensive types of units than unsubsidized FHA. As we have seen, our regression analysis did not reveal a significant program-related markup. However, in deriving the value of the housing produced under Section 236, we used the estimated regression parameter for "a_i," as opposed to assuming a value of zero. Since the program had a positive (but insignificant) markup, the estimates of housing "value" will be conservative. Using this approach, we derived a project-related markup of about 3 percent.

A number of different patterns were observed within the Section 8 new construction program. The major program variants -- SHFA uninsured and HUD- and SHFA-processed FHA -- built units that were worth about $800 to $1,400 less than unsubsidized FHA housing (Column 3). These differentials represented average savings of about 4 to 6 percent for FHA projects, and 3 percent for uninsured SHFAs. However, the economies that arose from the types of units built were accompanied by program-related markups ranging from $2,200 to $3,700. The net result of these program markups was to eliminate any savings associated with project type, producing average hard costs that were 5 to 12 percent higher than those observed under unsubsidized FHA.

The overall differentials were even larger for the Section 202 program, which tended to produce more expensive types of

units than either HUD- or SHFA-processed Section 8. While Section 202 units were typically smaller than unsubsidized FHA, project-related savings were close to zero, undoubtedly due to the program's concentration of high-rise buildings. Thus, the relatively high costs of Section 202 units vis-a-vis unsubsidized FHA primarily reflect the rather large program-related markup, which added about $6,265 to the average unit's costs. In the end, the hard costs of Section 202 units were about 24 percent higher than the costs of unsubsidized FHA.

In contrast, the analysis does not reveal any noticeable difference between either the characteristics or the costs of 11(b) projects vis-a-vis unsubsidized FHA. The average costs of 11(b) projects are not significantly different from the costs of unsubsidized housing, and there was no program markup uncovered in the regression analysis. As a result, it would appear that the 11(b) program is constructing projects that are very similar to unsubsidized FHA developments at about the same overall costs. However,this finding should be viewed with caution, since the sample size is relatively small (= 19).

Unlike its new construction counterpart, Section 8 substantial rehabilitation typically produced projects that were worth about $1,400 to $3,800 more than the average unsubsidized newly constructed unit, resulting in a 6 to 16 percent positive cost differential associated with project type. Much of this differential undoubtedly reflects the concentration of high-rise elevator buildings found in this program type. For FHA rehabilitation projects, the cost effects of producing more expensive housing were effectively offset by the program savings due to the relative efficiency of renovation vis-a-vis new construction. As a result, these program variants were able to provide housing worth about 6 to 12 percent more for roughly equivalent average costs. However, the preponderance of gut rehabilitation in our sample of SHFA rehabilitation projects produced a positive program markup, resulting in an overall average cost differential vis-a-vis unsubsidized new construction of some 34 percent.

Conventional Public Housing also appeared to produce more expensive types of units than those constructed under the unsubsidized FHA program. Recalling the patterns described in Chapter 4, the 9 percent markup related to project type probably reflects a greater number of larger units and more expensive structure types. For example, over 60 percent of Public Housing projects consist of high-rise elevator buildings or single-family structures; only 13 percent of unsubsidized FHA projects fall into one of these structure types. But the project-related markup in costs was relatively low in comparison to the program-related differential, which added about $13,000 to the cost of the average unit. These two factors combined produced hard costs in Conventional Public Housing that were 62 percent higher than the average cost of unsubsidized FHA.

In contrast, the Turnkey program appears to have produced less expensive kinds of units than Conventional Public Housing. Since their "project-related" markups were close to zero, Turnkey Public Housing appears fairly similar to unsubsidized FHA and 202/8 in terms of the "value" of units produced. However, the absence of project-related markups did little to reduce the overall cost of Turnkey housing. Since the program-related markup in hard development costs was extremely large, the average Turnkey project had costs that were about the same as Conventional units, and some 62 percent higher than unsubsidized FHA. However, the reader should note that part of this differential may reflect soft development costs embedded in the reported expenditures on improvements of Turnkey projects.

Table 5-7 takes the estimated project- and program-related markups in hard development costs, and uses them to derive comparable breakdowns for Total Development Costs. The first column in the chart presents the average per unit total development cost for each program/financing variant. The second column presents the average difference in total costs vis-a-vis unsubsidized FHA. As before, the remaining columns

Table 5-7

BREAKDOWN OF OBSERVED DIFFERENCE IN PER UNIT TOTAL DEVELOPMENT COSTS,[a]
SUBSIDIZED HOUSING VERSUS UNSUBSIDIZED FHA

	Average Total Development Costs Per Unit (Column 1)	Average Difference in Per Unit Costs Relative to Unsubsidized FHA (Column 2)	Composition of Total Cost Differential					
			Cost Differences Related to Project Characteristics			Cost Differences Related to Program/Financing Type		
			Δ Hard Costs (Column 3)	Δ Soft Costs (Column 4)	Δ Total Development Costs (Column 5)	Δ Hard Costs (Column 6)	Δ Soft Costs (Column 7)	Δ Total Development Costs (Column 8)
SECTION 8								
NEW CONSTRUCTION								
202	$ 33,537	+ 3,609	- 183	- 48	- 231	+ 6,265	- 2,425	+ 3,840
HUD FHA	31,248	+ 1,320	- 1,015	- 266	- 1,281	+ 2,263	+ 338	+ 2,601
11(b) Insured	31,705	+ 1,777[b]	+ 749[c]	+ 196[c]	+ 945[c]	+ 1,126[c]	- 294	+ 832[c]
SHFA FHA	31,876	+ 1,948	- 1,362	- 356	- 1,718	+ 3,437	+ 229	+ 3,666
SHFA Uninsured	30,818	+ 890[b]	- 774	- 203	- 977	+ 3,687	- 1,820	+ 1,867[c]
SUBSTANTIAL REHABILITATION								
HUD FHA	31,368	+ 1,440[b]	+ 2,796	+ 732	+ 3,528	- 2,063	- 25	- 2,088
SHFA FHA	30,982	+ 1,054[b]	+ 1,363	+ 357	+ 1,720	- 766	+ 100	- 666
SHFA Uninsured	37,482	+ 7,554	+ 3,759	+ 984	+ 4,743	+ 4,225	- 1,414	+ 2,811
PUBLIC HOUSING								
Turnkey	40,887	+ 10,959	- 14	- 4	- 18	+ 14,644	- 3,667	+ 10,977
Conventional	41,451	+ 11,523	+ 2,042	+ 534	+ 2,576	+ 12,709	- 3,762	+ 8,947
236 RENT SUPPLEMENT	32,474	+ 2,546	+ 694	+ 182	+ 876	+ 1,797[c]	- 127	+ 1,670[c]
UNSUBSIDIZED 221(d)4	29,928	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a]All Cost Data are weighted to reflect population means.

[b]Difference in means was not significantly different from zero with a 90 percent confidence interval.

[c]Coefficient used to calculate differential was not significantly different from zero with a 90 percent confidence interval.

attempt to decompose this differential into its project- and program-related elements. The statistics differ from those presented earlier in that they consider project- and program-related differences in the soft components of development costs.

The third column of Table 5-7 presents our earlier estimates of project-related differences in hard development costs. To derive estimates of the "soft" costs that would be associated with such differentials (Column 4), we multiplied the figures in Column 3 by 0.2617, the average ratio of soft to hard costs for unsubsidized FHA. This product represents the average cost differential that would have occurred in the unsubsidized housing market. The project-related difference in Total Development Costs (Column 5) was then defined as the sum of these soft and hard cost differentials.

The next step in our calculations was to derive estimates of the total program-related markup. From Column 2, we knew the actual difference in total development costs; while from Column 5, we could estimate the average markup (or discount) associated with the types of units built. The overall program-related markup (Column 8) was defined as the difference between these two amounts. Decomposition of this differential into its hard and soft components was then straightforward. Since we had already estimated program-related differences in hard development costs, we could estimate the difference in soft development costs by subtracting the hard cost differential (Column 6) from the difference in Total Costs (Column 8).

In general, seven out of the 12 program variants had average total development costs that were significantly higher than the average costs of unsubsidized FHA (Column 2). Total costs for 11(b) and FHA rehabilitation projects were again fairly similar to the average costs of unsubsidized housing. In addition, the average differential for uninsured SHFA projects is insignificant. However, with the exception of 11(b), an examination of the program- and project-related differences embedded in average costs reveals significant difference between each program variant and unsubsidized FHA.

Project-related differences in Total Development Costs reveal the same basic patterns that were uncovered in the previous chart. Indeed, since the hard cost differential was simply scaled by a common factor to derive the estimated difference in total costs, such consistency is to be expected. However, the decompositon of program-rated differences into their hard and soft components in Table 5-7 provides additional information on some of the major trade-offs that have been described throughout this report.

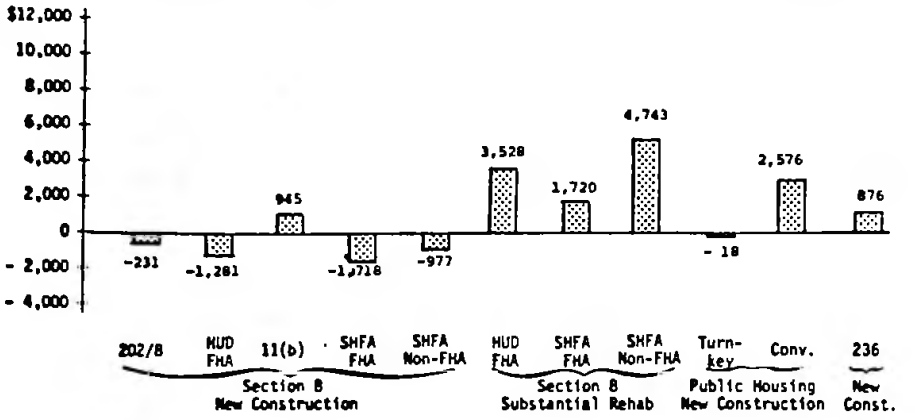
As we have seen, all of the program variants had positive program-related markups in their hard development costs, although the differentials were insignificant for 11(b) and Section 236. In contrast, there was much more variation in the program-related differences in the soft components of development costs. As expected, the differentials were negligible for the various kinds of FHA programs considered in the analysis. However, the other program variants recorded relatively large discounts in their soft components of development costs, ranging from about $1,800 for uninsured SHFA projects to about $3,700 for Public Housing. As we have seen, these discounts helped to reduce the overall markups in these programs. Indeed, for uninsured SHFA projects, it eliminated the differential entirely, so that the average total costs of such developments were roughly comparable to the average costs of unsubsidized housing.

Figure 5-4 presents a graphic summary of the basic information presented in Table 5-8. The first figure shows project-related differences in total development costs. As we have seen, about half of the program variants produced relatively expensive kinds of units when compared to unsubsidized FHA; the other half -- which included most Section 8 new construction and Turnkey Public Housing -- produced units worth about the same amount as unsubsidized housing, or marginally less expensive. The second figure presents program-related difference in total costs. While two rehabilitation programs registered discounts in total costs,

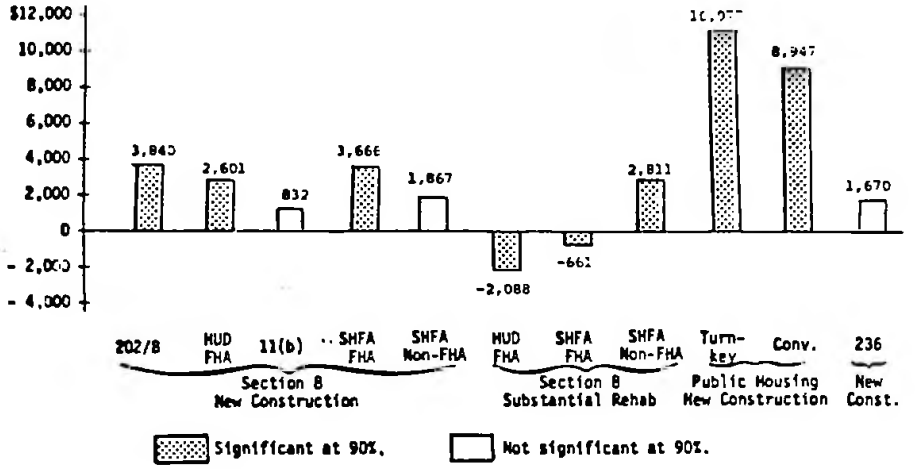
Figure 5-4

SOURCE OF DIFFERENCE IN TOTAL DEVELOPMENT COSTS

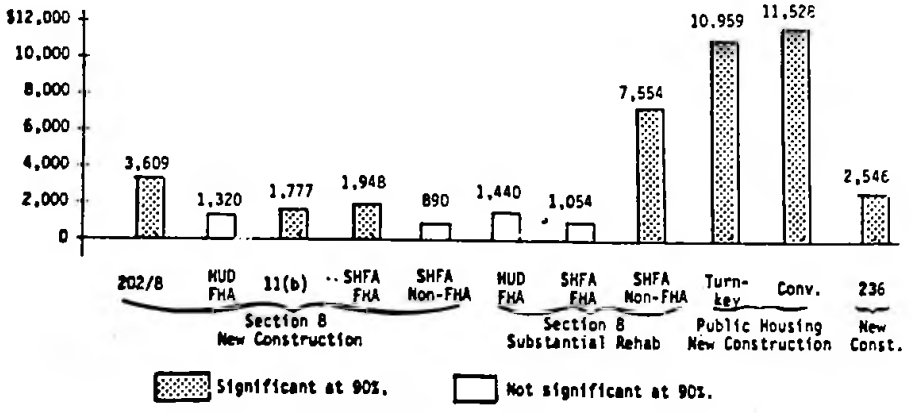
5-4A: AVERAGE PROJECT RELATED DIFFERENTIALS ($)



5-4B: AVERAGE PROGRAM-RELATED DIFFERENTIALS ($)



5-4C: AVERAGE TOTAL COST DIFFERENTIAL ($)



the remaining program variants all exhibited positive markups, and all but three were statistically significant. The third figure in the chart displays the average difference in total development costs vis-a-vis unsubsidized FHA. As is apparent from that chart, average total costs were higher for most types of subsidized housing, and in some instances, the differences were very large.

5.5 Summary

While the analysis presented in this chapter has examined a fairly large number of factors affecting the costs of multifamily housing development, it has focused on the relative costs and nature of housing that has been produced under various types of subsidized and unsubsidized programs. In general, most of the observed variation in the programs' average development costs reflects program-related markups, as opposed to differences in the types of projects built. Although the programs did vary in the underlying "value" of the housing produced, such differences were typically small in comparison to differences in the costs of constructing a given unit. It is also important to note that the project-related markups that were observed typically reflected fundamental differences in project design or structure type. In particular, there is no evidence to suggest that observed differences in average program costs result from variations in the level of project or unit amenities.

But despite these similarities, our analysis of project- and program-related markups (and discounts) did uncover some distinctly different patterns for the various program/financing types. The major findings are summarized below:

- Section 8 New Construction. The major variants of the Section 8 New Construction Program -- HUD-FHA, SHFA-FHA, and SHFA-uninsured -- tended to produce less expensive types of projects than those developed under unsubsidized FHA. However, these project-related savings were typically fairly small (3 to 6 percent) and were more than offset by program-related markups in hard development costs

ranging from 10 to 16 percent. The higher construction costs of uninsured SHFA units were offset by significant savings in their soft components of development costs; as a result, their total costs were roughly comparable to the total costs of unsubsizdized FHA. However, the soft costs of insured Section 8 projects were virtually identical to unsubsidized FHA. As a result, such projects continued to have a significant program markup, even when viewed from the perspective of their total development costs. In the end, their average costs were about 4.4 percent higher than the average costs of unsubsidized FHA housing.

In contrast, Section 202/8 appeared to have produced units whose underlying value was roughly comparable to unsubsidized FHA and, thus, marginally more expensive than the other Section 8 new construction variants. In the absence of project-related savings, the relatively high costs of Section 202/8 is largely explained by program-related markups in hard development costs, which averaged about 24 percent. Although large savings in the soft components of development costs helped to reduce the total development costs of Section 202 projects, their average total costs were still about 12 percent higher than the average cost of unsubsidized FHA.

And finally, 11(b) projects appeared to be fairly similar to unsubsidized housing, both in terms of costs and in the kinds of units built. However, this latter finding may simply reflect their relatively small sample size (= 19).

- Section 8 Substantial Rehabilitation. In contrast to most types of Section 8 New Construction, Section 8 Substantial Rehabilitation typically produced more expensive types of units than unsubsidized FHA, with project-related markups ranging from about 6 to 17 percent. However, FHA-sponsored projects typically produced these units at a significantly lower cost than would have occurred had the projects been built under unsubsidized FHA. As a result, their total development costs were almost identical to the costs of newly constructed unsubsidized units.

  The program-related savings observed for FHA-sponsored projects undoubtedly reflect the relative efficiency of most renovation vis-a-vis new construction. However, the preponderance of gut rehabilitation for uninsured SHFA projects eliminated all such savings, and resulted in average development costs that were about 25 percent higher than the average

costs of unsubsidized FHA. Since the sample of such projects is relatively small, this pattern may not characterize uninsured SHFA rehabilitation in general. However, it does serve to illustrate the general inefficiency of gut rehabilitation as a mechanism for producing subsidized housing.

- Public Housing. Conventional Public Housing has produced more expensive types of units than those developed in the unsubsidized market, primarily due to its concentration of large units and relatively expensive structure types. In general, these project-related differences added about 9 percent to the costs of Conventional Public Housing vis-a-vis unsubsidized FHA. While such markups are large in comparison to the other new construction programs, they are small when compared to the program-related markups for this program variant. Although the soft costs in Public Housing are relatively low, the large differentials in hard development costs produced program-related markups in total costs that averaged about 31 percent. Such markups were twice as high as those observed under Section 202/8, and over three times as high as the markup for HUD-processed Section 8. Combined, the project- and program-related differentials for Conventional Public Housing produced average development costs that were almost 40 percent higher than unsubsidized FHA.

  In contrast, the kinds of units that were developed under the Turnkey Program were less expensive than those produced under Conventional Public Housing, and fairly similar to those developed under unsubsidized FHA. However, the absence of project-related markups for Turnkey units did not result in lower costs. Rather, the extremely large program-related markup in hard development costs (62 percent) produced average total costs that were roughly comparable to Conventional Public Housing, and about 37 percent higher than the average costs of unsubsidized FHA.

- 236 Rent Supplement. And finally, the Section 236 Rent Supplement program appears to have produced marginally more expensive kinds of units than those developed under unsubsidized FHA . Although there is some evidence of a positive program markup, it is statistically insignificant. This finding implies that the higher costs of Section 236 projects vis-a-vis unsubsidized FHA are primarily related to characteristics of the units developed.

Chapter 6

FACTORS ACCOUNTING FOR PROGRAM DIFFERENTIALS

As seen in Chapter 5, the relative costs of constructing an identical housing unit vary considerably under the different program/financing types. In general, the hard costs of newly constructed subsidized units exceed the costs of otherwise similiar units developed under unsubsidized FHA. For most of the program variants the differences were fairly small, ranging from about 10 percent for HUD Processed Section 8 to about 16 percent for uninsured SHFA. However, for Section 202/8 and Public Housing the differences are more dramatic, with estimated program mark-ups of 27 and 50 percent respectively.

The observed mark-ups for "bricks and mortar" costs of newly constructed subsidized units undoubtedly reflect a host of complex factors, including processing requirements and subtle differences in design or construction quality. They also raise a number of questions concerning local efficiency and the incentives under the various programs to control the costs of subsidized housing development. While the current study is limited in its ability to explain these variations in any systematic fashion, it is possible to identify some of the likely factors that may account for higher construction and development costs. In particular, it is important to address these issues for Section 202/8 and Public Housing. Given the relatively cost-effective performance of these programs when viewed from a life cycle perspective (see Chapter 7), it is apparent that successful efforts to control initial development costs could translate into enhanced long-term savings to the government.

6.1 Sources of Development Cost Mark Ups

In attempting to explain the program mark-ups associated with Public Housing and Section 202/8, it is essential to bear in mind that these estimates reflect cost differences among programs after controlling for differences related to the characteristics and location of the units. For example, Conventional Public Housing has produced relatively expensive types of units compared to unsubsidized FHA; in particular, the program has tended to produce larger units and more costly structure types such as high-rise elevator buildings or very low density projects. However, as shown in Chapter 5, these and other project related differences added only about 9% to the costs of Conventional Public Housing vis a vis unsubsidized FHA. Given average total development costs that were 40% higher than FHA, the remaining 31% reflects "program related" mark-ups as opposed to differences in the types of units built.

In order to identify the factors that might account for these program differentials, we relied primarily on the insights of knowledgeable HUD officials. These include representatives from the Multifamily, Architectural and Engineering, and Cost branches at six HUD field offices, as well as HUD Central Office staff. Additional insights into the reasons for cost variations were provided by outside reviewers and commenters. These included a panel of housing experts convened by the National Association of Housing and Redevelopment Officials and a group of architects, developers and other housing specialists who participated in a Symposium on the study findings. Where possible, we used project data to test the hypotheses advanced.

In general, explanations of higher costs--particularly for Public Housing--fall into five basic categories. These are: (1) differences due to design or construction quality; (2) unusually high cost budget items such as land, off-site, and site improvements; (3) differences in developer incentives; (4) differences in cost control mechanisms; and (5) other factors related to processing, including the experience of the processing agency.

6.2 Design and Construction Quality

Undoubtedly the most oft-cited explanation for higher development costs in Public Housing is the incentive for PHAs to build durability into their projects in order to reduce subsequent operating expenses. Indeed, as provided in Section 6(b) of the Housing Act of 1937, extra durability, quality design, energy conservation measures, and amenities needed to guarantee a "safe and healthy family life and neighborhood environment" are to be incorporated into Public Housing projects over and above HUD's Minimum Property Standards. HUD field offices are to develop a list of specific requirements to meet local conditions, and PHAs may request additional requirements for individual projects.

The design/quality issue encompasses both special features and amenities which may be included in the project as well as aspects of construction which may add to a project's durability. In terms of amenities, several observers have suggested that Public Housing development costs may include more extensive community space (such as community rooms serving an entire neighborhood) and/or certain amenities or features (such as full basements or garages) not included in the regression analysis. Similarly, Section 202/8 projects may contain a range of special features for their elderly or handicapped tenants. While these undoubtedly add to project costs, the regression analyses controlled both for amenities and for the proportion of space devoted to residential use. Thus, the estimated program mark-ups reflect cost differences over and above these factors.

With respect to construction quality, a single variable--exterior finish--was used to measure durability. While this variable also proved insignificant, it may not capture the underlying quality or durability of construction. In fact, absent onsite inspections it is difficult to make definitive statements about the extent to which the observed program mark-ups reflect higher construction quality or design standards. Nevertheless, the indirect evidence does shed considerable light on this issue.

Our first approach was simply to ask Area Office personnel to compare the construction quality of their Public Housing and FHA projects. While several Area Office staff indicated that Public Housing projects represented a "better product" compared to FHA, the majority indicated that there is currently no substantial difference in construction quality, or that Public Housing projects are only marginally better constructed than FHA projects. This contrasts with the general perception that Public Housing produces virtually indestructible projects, with associated higher costs.

In general, the types of quality differences cited by A&E branches related to better than average hardware, such as shower heads and faucets, or to other equipment, including insulated exterior doors, high security locks, and solid wood kitchen cabinets. On the other hand, several Area Offices did indicate construction-related differences, including higher standards for roof and wall insulation, perimeter insulation, higher quality roofing, treated framing for three story structures, and heavy duty resilient flooring. While these items would again produce higher hard costs, Area Offices consistently indicated that the overall differential was rather small.

One informal Area Office estimate was that higher construction standards added as little as 5 percent to Public Housing costs. To test the reasonableness of this estimate, we compared the proportion of total improvement costs[1] covered by Dwelling Construction and Equipment (DC&E) for our sample of FHA and Public Housing projects. Since DC&E costs relate most directly to construction quality, a comparison of this type should indicate the extent to which higher Public Housing costs reflect investments in the structures as opposed to other types of improvements.

As will be described later in this chapter, DC&E costs for FHA projects were estimated to cover about 79 percent of total

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[1]As defined in this study, total improvements for Public Housing include: DC&E, site improvements, nondwelling construction, and A&E.

improvements. For Public Housing, on the other hand, this ratio was only 64 percent. When these proportions are applied to average improvement costs, they imply DC&E expenditures of $17,327 for unsubsidized FHA as compared to $22,675 for Turnkey and $22,231 for Conventional Public Housing. Thus, the estimated difference in average DC&E expenditures is only 31 percent as compared to 59 percent for total improvement costs. This suggests that less than half of the Public Housing differential is explained by higher dwelling construction costs (which may be related to quality), and that other cost categories contain the bulk of the program mark-up.[2]

Another approach to the quality/durability issue is to examine the reasonableness of up-front expenditures on durability in terms of operating cost savings. Assuming that all of the hard cost markup for Public Housing reflects real differences in construction quality, the question becomes: how much would PHAs need to save on operating and maintenance costs to justify this expenditure? Based on the life cycle costs described in the financing analysis, we calculated the required annual savings for Turnkey and Conventional projects over 20 and 40 years. Using 20 year costs, PHAs would have to decrease operating expenditures by an unlikely 55 percent per year for Conventional projects in order to justify the higher investment. For Turnkey projects, a 68 percent decrease would be needed. Given the size of the required savings, it appears that these large upfront investments for the sake of maintenance and operating savings would be difficult to justify.

Finally, one might approach the issue by comparing the development costs among programs with respect to tenant type. In

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[2]Some added weight may be given to this hypothesis by an internal HUD review entitled "A Comparative Study Between the Total Replacement Costs of 221(d)4 Section 8 projects and the Total Development Costs (TDC) of Public Housing projects (non-Indian)." Here, DC&E costs for Public Housing in three Area Offices fell fairly close to those of Section 8, despite higher TDCs.

particular, a disproportionate share of large, female-headed households with children reside in Public Housing. Since such households undoubtedly place a greater amount of wear-and-tear on their units, it is argued that Public Housing has to build more durable and more expensive projects in order to house its intended beneficiaries.

To gain some insight on this issue, we stratified our sample into two separate groups--elderly and family projects--and reexamined the structure of development costs for each of these project types. The kinds of families served by the Public Housing program may still be fairly different from the types of families participating in Section 8. However, this argument is more difficult to make for elderly projects. As a result, a comparison of relative costs within the subset of such projects should control for any quality differences resulting from a desire to serve the housing needs of the poorest households.

Table 6-1 presents unit development costs for family and elderly projects, weighted to reflect the underlying program averages. In general, the hard costs of developing family housing are about 4 percent higher than the cost of elderly units. However, within each project type, development costs vary in a way that is roughly consistent with that observed for the sample as a whole. In particular, elderly housing developed under the Public Housing Program is significantly more expensive than housing developed under Section 8 or Section 202/8. While these mark-ups may still reflect differences in the underlying quality of construction, it is more difficult to argue that such differences are required.

This general pattern is also evident from the estimated program mark-ups in "hard" development costs presented in Table 6-2. Such mark-ups were derived by estimating separate regression equations for the samples of elderly and family projects. Although the independent variables appearing in these equations are the same as those described in Chapter 5, the small sample sizes that resulted

Table 6-1

PER UNIT DEVELOPMENT COSTS BY PROJECT TYPE: 1980
DOLLARS ADJUSTED FOR REGIONAL DIFFERENCES IN COSTS
(Weighted)

	HARD DEVELOPMENT COSTS		TOTAL DEVELOPMENT COSTS	
	Family	Elderly	Family	Elderly
SECTION 8				
NEW CONSTRUCTION				
202/8	NA	$29,619	NA	$33,300
HUD FHA	$25,978	24,261	$32,506	30,332
11(b) Insured	25,081	25,893	30,566	32,365
SHFA FHA	26,100	25,525	32,586	31,242
SHFA Uninsured	28,586	25,184	33,441	28,846
SUBSTANTIAL REHAB				
HUD FHA	25,258	23,282	32,600	29,573
SHFA FHA	26,466	21,693	33,735	27,617
SHFA Uninsured	33,844	28,267	39,852	33,673
PUBLIC HOUSING				
Turnkey	38,817	37,545	41,799	39,312
Conventional	40,712	33,757	45,427	36,679
236 RENT SUPPLEMENT	26,307	25,530	32,674	31,038
UNSUBSIDIZED FHA	23,737	NA	29,950	NA

Table 6-2

ESTIMATED PROGRAM MARKUPS IN HARD DEVELOPMENT COSTS:
FAMILY VERSUS ELDERLY PROJECTS

	Combined Regression	Elderly Regression	Family Regression
SECTION 8 NEW CONSTRUCTION			
202/8	+18.2[a]	+20.2[a]	NA
Other	+ 9.0[a]	+12.4[a]	+ 7.1[a]
SECTION 8 SUBSTANTIAL REHABILITATION[1]	-11.6[a]	-11.7[a]	- 8.5[a]
PUBLIC HOUSING	+45.9[a]	+44.1[a]	+41.6[a]

[1]Excludes SHFA/non-FHA Rehabilitation.

[a]Underlying regression parameters are significant at the 99 percent level.

from stratification required us to collapse the program dummies into four major categories: (1) Section 202/8; (2) Section 8 New Construction; (3) Section 8 Substantial Rehabilitation; and (4) Public Housing. The base case in the stratified regressions thus includes both Section 236 Rent Supplement and unsubsidized FHA, both of which have been shown to have roughly similar costs.

The program mark-ups presented in Table 6-2 present fairly strong evidence that the Public Housing costs differentials are not necessitated by the type of household served. If this were true, one would expect the markups to disappear in the subset of elderly projects. In contrast, our analysis suggests that program markups are relatively constant across project types. In particular, both elderly and family units developed under the Public Housing program have markups of about 42 to 44 percent when compared to similar units of either unsubsidized FHA or Section 236 Rent Supplement. Likewise, the markups associated with Section 202/8 and Section 8 New Construction are not related to tenant type.

Given these results, as well as the general impression offered by Area Offices that actual construction quality differences between Public Housing and other types of projects are slight, it is appropriate to look elsewhere for likely sources of Public Housing markups. Interestingly, Area Office personnel were not surprised by the overall higher costs associated with the Public Housing program, finding higher costs consistent with Area Office experience. While a range of explanations were offered, almost all Area Offices cited land, off-site, and site improvements as high cost items for their Public Housing projects. Since these items are all included in the "hard cost" mark-ups, it is important to look at aspects of the site acquisition process which could produce higher costs in these categories.

6.3 Land, Off-site and Site Improvements

As seen in Chapter 5, Public Housing tends to have land and off-site costs that are about twice as high as those of similarly located unsubsidized projects. While the high cost of land and

off-site work was considered by Area Office staff to be an important factor in explaining higher Public Housing costs, the reasons suggested for these higher land costs varied widely. In general, Area Office personnel pointed to the rather cumbersome Public Housing site acquisition process as the primary factor accounting for higher costs. However, a number of observers indicated that in at least some cases these charges reflect costs of providing area services which should not be borne by the project alone, and/or inappropriate choices for locating Public Housing projects.

In selecting sites for Public Housing, PHAs must apply an explicit set of site and neighborhood standards. One result of these standards is to limit the available choices for Public Housing siting. For example, a recent study of Public Housing production problems in HUD Region IX identified the lack of available, suitable sites as a major obstacle in the site acquisition process.[3] This was found to be true for PHAs throughout the region including those serving central cities, suburbs, and rural areas.

While site standards will affect projects developed under any of HUD's programs, additional factors--such as local resistance--may operate to further restrict the location of Public Housing projects. Although observers disagree on the extent to which local resistance continues to affect the Public Housing program, it has nevertheless been suggested that subtle pressures to minimize community opposition can result in the selection of outlying, or otherwise less desirable, sites requiring above average expenditures for utility connections or site improvements. These siting constraints, combined with the minimal leverage PHAs have in acquiring properties could easily result in overall higher costs.

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[3]"Production Problems in Public Housing," Undated Draft, Prepared by the Office of Program Planning and Evaluation, HUD Region IX, for the Region IX HUD/PHA Executive Director's Task Force. p. 28.

One important factor may be that owners of suitable sites are aware of PHA siting constraints, using these to maximum advantage. Similarly, it has been suggested that owners may demand higher prices when selling to a PHA, in expectation of a lengthy review process. Probably the most important factor, however, is the fact that all PHA purchase offers must be predicated on a HUD appraisal rather than through normal bargaining channels available to the private sector and developers of other types of HUD projects. These appraisals may affect site acquisition in several ways. First, appraisals are based on the "highest and best use", in some cases resulting in higher appraised values than the intended use would warrant. In other cases, particularly in competitive markets, the appraisal may be lower than the owner is willing to accept, resulting in a time-consuming search for a new site.

Finally, where private developers will normally select the least expensive suitable site, PHAs have less incentive, and less ability, to get the best deal available. Given that land and site improvement costs are not covered by prototype cost limits, PHAs have greater latitude in these accounts. This could result either in a failure to hold site costs to a minimum or, in some cases, to improper site selection.[4] Additionally, it appears that a large number of Public Housing projects are affected by negative site reviews and/or site rejection by HUD.[5] Negative reviews can affect both processing time and project budgets as additional reports are prepared and mitigation measures incorporated into the design. Rejection usually necessitates the search for a replacement site.

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[4]Instances of impropriety cited by Area Offices range from the selection of "luxury" sites to assessing Public Housing projects for extensive off-site improvements in outlying areas subsequently opened for private development.

[5]Office of Program Planning and Evaluation, HUD Region IX, Op. Cit., p. 29.

Despite the range of factors that may account for higher site costs in Public Housing, it is fairly clear that PHAs are either paying more for their land or that they are investing sizeable amounts to make the sites suitable for development. This would tend to argue either for additional controls on costs allowable in these accounts or for more PHA flexibility in negotiating suitable for Public Housing sites.

6.4 Developer Strategies

In comparing improvement costs among the various programs, it is striking that the program variants with the deepest capital subsidies--Section 202/8 and Public Housing--have the largest overall markups. While this would be consistent with an incentive to spend more upfront in order to realize subsequent savings in operating costs, construction quality differences--at least for Public Housing-- appear to be only a partial explanation for hard cost mark-ups.

However, another similarity between the two programs is the single opportunity for profit on the part of the builder/developer. Looking at unsubsidized FHA, for example, the profile of project developers suggests a relatively small builder, perhaps with somewhat lower costs, but, more importantly, one that has decided on a strategy of realizing gains from equity build-up in the property. Similarly, Section 8 developers can expect both an income stream and some equity growth. More importantly, considerable up-front profits are available through syndication.[6] By contrast, Public Housing and Section 202/8 builders must realize all of their return from the construction period. In this case, higher development costs may reflect builder mark-ups related to a single opportunity for profit. In particular, the recorded profit rate for our sample Section 202/8 projects is a mere 3 percent, making it highly likely that some additional profit is embedded in other builder expenses.

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[6]Projects are generally syndicated for between 20 and 25 percent of the mortgage amount.

Given builder profits of approximately 10 percent for other types of Section 8 projects, such buried profit could account for a significant proportion of the Section 202/8 mark-up.

It is also interesting to note that two of the Area Offices contacted suggested that the different program types tend to attract very different types of builder/developers. Section 8 projects, for example, tend to draw larger developers from a wider geographical area. Given an interest in project ownership and syndication, these developers rarely, if ever, bid on Public Housing projects. By contrast, the Public Housing bidding requirements tend to open the process to an entirely different group of builders and architects who are, for the most part, unacquainted with the FHA system. In particular, one Area Office indicated that these are often commercial builders, with higher costs and a rather different approach to the construction process. It has also been suggested that Section 202/8 sponsors have experienced difficulty in locating suitable builders, particularly for their smaller projects.

Finally, given the apparent lack of overlap between FHA and Public Housing builder/developers, it seems appropriate to question whether any real competition exists within the Public Housing program. For example, some observers suggest that Turnkey developers have tended to comprise relatively small groups submitting uniformly inflated bids.[7] In view of the essentially fixed-price nature of the Turnkey contract, such lack of competition could severely affect the program's ability to realize value for its investment. While only one Area Office confirmed this suggestion, the overall attitude of the Area Offices towards Turnkey was consistent with the disfavor into which the program has fallen. In general, while the program was considered to be good in concept, Area Offices believed that it produced "less project" for the same cost as the Conventional program.

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[7]Higher bids could in part be attributed to developer expectations of lengthy processing and review periods.

6.5 Cost Control Mechanisms

The ways in which the various programs control construction and development costs provides yet another possible explanation for cost differences among them. While, ultimately hard costs must stand against the drawings and specifications, the dollar limits and other controls imposed by the programs may affect a developer's approach to design and construction quality. In particular, many Section 8 developers have confirmed that they work backwards from permissable Fair Market Rents (FMRs) in order to arrive at their improvement cost figures. Similarly, it has been suggested that Turnkey developers and PHAs have an incentive to build to the maximum permitted by program limits.

6.5.1 Section 8 FMRs

Within the Section 8 program the principal cost control mechanism is the system of FMRs. FMRs are set by HUD for each market area in the country and are designed to reflect the rents of comparable unsubsidized units. Rents for family units must fall within 100% of the FMR limits; rents for elderly units are set at 105% of the published FMR. Exceptions to the FMR limits of up to 110% and 120% may be approved by the Field Office director and the Assistant Secretary of Housing (HUD) respectively. For FHA insured projects two additional controls are applied: (1) a rent comparability test designed to ensure that rents are in conformity with those of near-by units of modest design, and (2) a set of statutory per-unit maximums established by Congress for each insurance program.

While the effects of the three limits will vary by project, the survey data suggest that FMRs are of considerable importance to Section 8 developers. Overall, 89 percent of responding Section 8 developers indicated that FMRs were very important or important to

the formulation of their development cost budgets. In fact, the program appears to provide rather strong incentives to design projects whose rents fall close to the FMR limits. In particular, ranking procedures for Section 8 projects provide for only 5 of a possible 100-110 points to be assigned on the basis of rent. As a result, developers may compete primarily on the basis of design and amenities as opposed to cost. Moreover, the point system does not distinguish between those projects with rents at FMR limits and those which fall below FMRs, as both may receive the maximum 5 points.

For Section 8 projects which are subject to both FMR limits and FHA per-unit mortgage ceilings, it appears that FMRs have greater impact on project budgets. Fifty-eight percent of insured Section 8 developers indicated that FMRs were very important in determining the project budget as opposed to about 44 percent who rated FHA ceilings very important. Nevertheless, fully 89 percent of all developers subject to FMR maxima considered these to be very important or important to their project budgets. The following Section uses the study data to estimate how closely the various types of FHA projects build to their respective per-unit ceilings.

6.5.2 Building to Maximum Insurable Mortgage Ceilings

As shown in Chapter 4, average development costs are fairly similar across the different subsidized and unsubsidized FHA program variants. While the various programs have constructed different kinds of units for these development dollars--and while some appear to produce better units at a given cost--the similarity in the average level of expenditures across the different programs suggests that FHA maxima may often determine the amount that is actually spent. In general, one might expect developers of subsidized housing to build more closely to the limit to realize greater up-front profit and/or to save on operating costs later. Developers of unsubsidized 221(d)4 projects, on the other hand, must compete for tenants on the open market, making the overall mortgage amount a more critical factor in their development strategy.

To test this hypothesis, we estimated the ceiling that was applicable to each FHA project in our sample, and then compared this estimated ceiling to the actual mortgage amount. In any given year, the applicable mortgage ceiling will vary with sponsor type, bedroom count, building type, and location. While it is relatively easy to control for the first three factors, the impact of location is much more difficult to capture since each locality has a special adjustment factor that can be applied to the ceiling. Theoretically, such factors apply only to "high cost" areas. However, in practice they have been used to adjust for cost inflation and, as a result, almost all parts of the country have factors greater than one.

In order to estimate the mortgage ceiling governing the units in our sample, we inflated the 1980 ceilings for non-high price areas by a factor of 35 percent. This figure was derived by examining the median adjustment factor for HUD's field office cities. These adjusted ceilings were then compared to the projects' actual per unit mortgage, expressed in 1980 dollars for an "average price" location. While our procedures are admittedly approximate, the analysis does suggest differences in the relative tendency to build to the ceiling across the different program types.

The results of our calculations are presented in Table 6-3. The first column in the chart shows the estimated ceiling for each FHA program type. The second column depicts the actual per-unit mortgage amount; and the third column depicts the ratio of the actual mortgage to the estimated mortgage ceiling.

The figures in the chart suggest that Section 202 projects have a much greater tendency to build to the ceiling than the other FHA program variants. The average ratio of the mortgage amount to the estimated ceiling is over 100 percent, considerably above the other FHA program variants included in our analysis. The remaining subsidized program variants appear to be fairly similar, with an average ratio of about 80 percent. Interestingly enough, the lowest ratio (73 percent) was observed for unsubsidized FHA, which was also more likely to produce "equivalent" housing at a lower per unit cost.

Table 6-3

COMPARISON OF DEVELOPMENT COSTS AND
MAXIMUM INSURABLE MORTGAGES

	Estimated FHA Ceiling	Per Unit Mortgage Amount	Ratio of Mortgage to FHA Ceiling
SECTION 8			
NEW CONSTRUCTION			
202/8	$32,164	$33,434	1.04
HUD FHA	$34,097	$26,667	.79
11 (6) FHA	$35,441	$27,759	.80
SHFA FHA	$33,539	$27,176	.82
SUBSTANTIAL REHABILITION[a]	$35,562	$28,496	.83
236 RENT SUPPLEMENT	$34,665	$25,047	.82
UNSUBSIDIZED FHA	$34,349	$29,720	.73

[a]SHFA/FHA projects were excluded due to the small number of projects for which such calculations could be make.

These conclusions are further supported by a regression analysis that related the mortgage ratio (column 3) to a series of dummy variables representing the program and the sponsor type (nonprofit versus profit). According to this analysis, non-profit developers have a significantly higher tendency to build to the mandated ceiling, with the estimated ratio about 8.5 percent higher than those observed for profit making firms. In addition, all of the FHA program dummies were highly significant. For Section 202/8 developments, the estimated mortgage ratio was about 27 percent higher than the ratio for unsubsidized FHA, while the differential was about six to 11 percent for the other subsidized program variants.

6.5.3 Prototype Cost Limits

While the costs of various types of FHA and Section 8 projects may be affected by any of the three cost limits described above, Public Housing costs are controlled solely by per-unit prototype cost limits. Prototype cost limits cover only Dwelling Construction and Equipment accounts, and are designed to take into account both local costs and the higher construction quality standards applicable to Public Housing. Several issues about prototype costs were raised by Area Office staff contacted for the study.

First, it is widely assumed that PHAs base their project designs on the maximum allowed by the prototype limits. In general, PHAs are anxious to produce high quality projects, and further, since debt service costs are covered by the Federal Government, PHAs are less concerned about the costs of development than subsequent operating costs. Second, staff from two of the Area Offices expressed concern about the way prototype limits are set, suggesting that additional time and effort needs to be devoted to insuring that local prototypes accurately reflect market costs. In connection with this, some observers have implied that local offices have developed unnecessarily high limits in order to reduce friction with PHAs. By contrast, several Area Office staff expressed the opinion

that in some cases prototypes have been set too high[8] and that lower limits would assist them in rejecting what they believe to be excessive Public Housing designs.

Since prototype limits are set separately for each market within an Area Office's jurisdiction, we have not attempted to compare prototype limits with actual dwelling construction and equipment costs. Rather, we have focused on the effects of prototype limits as compared to FHA cost controls.

The relative stringency of the costs constraints embedded in Prototype costs limitations and FHA mortgage ceiling is rather difficult to assess, since the two limitations refer to different components of development costs. Prototype costs refer to two specific items: dwelling structures and dwelling equipment. Such items represent only about 64 percent of improvement expenditures for the typical Public Housing project, and only about 55 percent of total costs. In contrast, the FHA limitations refer to the project's total development costs (with some exemptions due to off-site costs and space not attributable to dwelling units). This difference in coverage alone implies that Public Housing cost constraints will tend to be less binding than those imposed by FHA, since a farily high fraction of a projects costs are excluded from statuatory limits.

Nevertheless, it is important to know if the constraints implicit in FHA ceilings allow for more or less expenditures on dwelling structures and equipment than those allowable under Public Housing. Some tentative conclusions can be drawn by using our sample data to estimate the relative importance of structures and equipment in the typical FHA project. Although such breakdowns were not available for all of the projects in our sample, we did examine some additional costs reporting records for a subset of 20 projects; that analysis suggests that items covered by prototype costs

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[8]High prototype limits may, for example, reflect the impact of historically higher Public Housing construction costs.

represent about 79 percent of FHA expenditures on improvements. We also know that improvements represented about 77 percent of the total development costs of FHA projects and that FHA mortgage ceilings refer to up to 90 percent of those total costs. Given these sample averages, one can take the FHA ceilings and work back to a figure that is more or less comparable to PHA prototype costs.[9]

The results of this calculation for six cities are shown in Table 6-4. The limits are presented for one-bedroom units in walk up, row, and elevator buildings. The first column shows the actual prototype limit effective as of June 1980. Column 2 presents the FHA "prototype equivalent", and Column 3 the ratio of prototype limits to the DC&E limit implicit in the FHA ceiling. As can be seen, the FHA equivalent is fairly close to actual prototypes for the non-elevator types, with prototypes permitting slightly less DC&E expenditures on average. For elevator types, however, prototype limits are more permissive, allowing for approximately 28 percent greater expenditure per unit.

In considering the comparison, it is important to remember that DC&E costs for Public Housing cover only 64% of improvements as compared to 79% for FHA. Thus while the transformation above

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[9]The DC&E limits implied by FHA Mortgage Ceilings are given by:

$$\text{PROTOTYPE EQUIVALENT} = \frac{(\text{FHA MORTGAGE CEILING})*(.77)(.79)}{.90}$$

The first term in the equation represents the Total Development Costs allowable under the mortgage ceiling (assuming a profit-making developer); multiplying these total costs by .77 estimates the implicit level of expenditures allowed for improvements; and multiplying this latter term by .79 estimates the implicit level of allowable expenditures on dwelling structures and equipment. The resulting product is the DC&E limit implicit in the FHA ceiling.

Table 6-4

COMPARISON OF PUBLIC HOUSING PROTOTYPE
LIMITS TO FHA PROTOTYPE EQUIVALENT (1BR UNITS, 1980)

	PHA Prototypes		FHA Prototype Equivalent	Ratio of PHA Prototype to FHA Equivalent
Kansas City	Walk up	19,300	18,960	1.02
	Row	20,350	18,960	1.07
	Elevator	29,450	23,127	1.27
Sacramento	Walk up	19,350	22,395	.86
	Row	21,650	22,395	.96
	Elevator	38,550	24,430	1.57
Phiadelphia	Walk up	23,800	24,335	.97
	Row	26,800	24,335	1.10
	Elevator	35,050	26,547	1.32
Birmingham	Walk up	16,250	20,155	.80
	Row	18,000	20,155	.89
	Elevator	28,100	21,987	1.27
San Antonio	Walk up	17,300	17,318	1.00
	Row	17,850	17,318	1.03
	Elevator	23,400	18,892	1.23
Milwaukee	Walk up	23,600	24,335	.96
	Row	26,100	24,335	1.07
	Elevator	28,650	26,547	1.07

results in relatively compatable DC&E limits, total FHA improvements average only 127% of prototype-covered items as opposed to 156% of these items for Public Housing. Again, the suggestion is that construction quality differences (reflected in prototypes) are not the source of Public Housing mark-ups. Rather, other improvement costs (including site improvements, non-dwelling construction, and A&E fees) absorb greater investments than for comparable FHA projects.

6.5.4 TDC Limits for Public Housing

Given the narrow coverage of prototype cost limits for Public Housing, it is clear that these controls are inherently less restrictive than the more comprehensive FHA ceilings. As indicated by various Area Office staff, the uncontrolled budget accounts represent a large part of Public Housing costs and may include expenses for items which serve more than one project. In particular, PHAs are said to charge development projects for various types of operating equipment (ranging from typewriters to maintenance vehicles) that will ultimately be used for PHA-wide operations. It is also widely believed that the large number of uncontrolled budget items permits PHAs to shift any excess costs from DC&E into unrestricted accounts.

In order to more effectively limit overall Public Housing costs, HUD is currently in the process of establishing total development cost limits for Public Housing. Further, as part of its cost containment policy, the Department had instructed field offices to ensure that total costs fall within 160% of prototypes for nonelevator structures and 145% of prototypes for elevator buildings. The intent of the policy was to define "reasonable" TDCs and to bring Public Housing development costs in line with those for Section 8.

As shown in Table 6-5, the TDC policy would have had the effect of keeping allowable Public Housing costs for non-elevator buildings fairly comparable to the maximums permitted by FHA mortgage

Table 6-5

COMPARISON OF FHA MORTGAGE CEILINGS WITH THE
COST CONTAINMENT POLICY FOR PUBLIC HOUSING

		FHA Mortgage Ceiling	Cost Containment Limits (160% or 145%	Ratio of Public Housing to FHA Limits
Kansas City	Walk up	31,083	30,880	.96
	Row	31,083	32,560	1.05
	Elevator	37,913	42,702	1.13
Sacramento	Walk up	36,713	30,960	.84
	Row	36,713	34,640	.94
	Elevator	40,050	55,897	1.39
Philadelphia 163 vs (140)	Walk up	39,894	38,080	.95
	Row	39,894	42,880	1.07
	Elevator	43,520	50,822	1.16
Birmingham 135-(138)	Walk up	33,041	26,000	.78
	Row	33,041	28,800	.87
	Elevator	36,044	40,745	1.13
San Antonio 116 vs (88)	Walk up	28,391	27,680	.97
	Row	28,391	28,560	1.01
	Elevator	30,971	33,930	1.10
Milwaukee	Walk up	39,894	37,760	.95
	Row	39,894	41,760	1.05
	Elevator	43,520	41,542	.95

ceilings. For elevator types, the TDC policy would again be more permissive than FHA, but considerably closer in range. Nevertheless, our data shows that Area Offices have historically approved TDCs for Public Housing well in excess of 160% and 145% of prototype. By program type, TDCs averaged 146 percent of DC&E for Turnkey, but 248 percent for Conventional projects.

6.6 Processing and Experience Factors

The final set of factors accounting for higher costs in Public Housing and Section 202/8 relate to processing, and the experience of the various actors involved. To begin, Area Offices consistently referred to the lengthy development period associated with Public Housing projects. As shown in Chapter 4, the pre-development period for Public Housing--and particularly Conventional Public Housing--is considerably longer than that for the other subsidized and unsubsidized programs. While processing time was included in the early regressions, it did not affect the program mark-ups. However, processing time may not capture the effort expended in the project's development. It was the opinion of several Area Offices that: 1) processing time for Public Housing could be considerably shortened, and 2) that this could result in substantial cost savings. It was also suggested that the Public Housing handbook needed to be clarified and simplified.

With respect to higher Section 202/8 costs, almost all of the Area Offices contacted mentioned the inexperience of Section 202/8 sponsors as the key factor. According to Area Office personnel, this inexperience results in considerable delay as well as extra effort needed to revise inadequate submissions. It has similarly been suggested that the time lags between development projects for Public Housing allow staff turnover to diminish PHA "experience," as measured by number of units developed. In this case, general inefficiency due to lack of experience might contribute to higher development costs for this program as well.

While it is true that Section 202 sponsors tend to be relatively inexperienced in terms of projects and units developed, the variable for sponsor experience consistently proved to be insignificant in the regression analysis. As a result, it is difficult to determine whether the experience proxies fail to capture the level of expertise needed to produce projects efficiently or whether the conventional wisdom about Section 202/8 sponsors overstates the impact of this factor on actual development costs. By the same token, we cannot relate PHA "experience" to higher public housing costs. However, the Region IX study cited earlier did find problems related to PHA capacity to be the major cause of delay in public housing production. Capacity problems may result both from lack of staff assigned to development and from a lack of staff with adequate development training.

By contrast, the experience of the processing agency appears to have a stronger relationship to project costs. For example, it has been suggested by some observers that Area Offices are almost entirely geared towards FHA and Section 8 processing, with comparatively little expertise in overseeing Public Housing development. The result might be greater inefficiency in processing or a reduced capacity to monitor and control Public Housing costs. It has also been suggested that processing for public housing receives relatively low priority, particularly during high activity periods, such as when insured projects must be processed through firm committment in order to qualify for GNMA Tandem financing.[10]

In order to test the impact of the Area Office's processing experience on a project's development cost, we examined a subset of projects consisting of State and HUD-processed Section 8, excluding Section 202/8 but including substantial rehabilitation. We then re-estimated the regression equations for hard and total development costs, adding a variable that measured the number of Section 8

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[10]Office of Program Planning and Evaluation, HUD Region IX, op. cit p.20.

projects previously developed by the processing agency, defined as either the HUD Area Office or the State Housing Finance Agency.[11]

Inclusion of this "experience" proxy did little to affect the coefficients of the estimated program dummies. However, the variable did prove significant, and had the expected negative sign. In particular, projects processed by agencies with considerable experience in the Section 8 program tended to have somewhat lower per unit costs than projects processed by less experienced agencies. As agency experience increased from 30 projects to 50 projects, unit development costs tended to fall by an average of 3 percent. While this effect is admittedly small--and while our proxy for experience is fairly crude--our data does suggest that more experienced agencies are likely to lead to savings in development costs.

While there are no comparable data for Public Housing processing, it is likely that the same relationship holds. On a more general level, the ultimate responsibility for approving appropriate designs and determining reasonable costs rests squarely with the local HUD field offices. As such, the experience of the staff and the cost-consciousness of the office as a whole are undoubtedly important factors in holding down the costs of Public Housing development.

6.7 Conclusion

As noted at the outset, the insights of knowledgeable program staff provide the best available basis for explaining the high program mark-ups associated with Public Housing and Section 202/8. However, our ability to test various hypotheses against the study data permits us to make several important conclusions.

To begin, it is unlikely that design or construction quality differences account for the large program mark-ups associated with Public Housing. While Public Housing projects do reflect somehat higher quality standards, the impact on costs to appear to be

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[11] FHA-insured SHFA projects were assumed to be processed by the Area Office as opposed to the State.

relatively minor. Moreover, assuming that cost differences do reflect real differences in quality, these investments would be difficult to justify either in operating cost savings or to meet the needs of different tenant types.

While quality differences were shown to be slight for most Public Housing projects, higher land and site development costs appear to be an important factor in increasing Public Housing costs. The causes of these mark-ups were difficult to pinpoint, but overall indicated a need for more careful review and control in this area. In addition, it appears that the large number of uncontrolled budget categories for Public Housing permits a greater proportion of Public Housing costs to fall into non-dwelling accounts. HUD is already responding to this problem by establishing total development cost limits for Public Housing. Finally, other programmatic differences including the incentives of the builder/developers and the experience of the processing agency appear to be important factors with respect to program costs.

For Section 202/8 projects, sponsor inexperience and extra amenity packages were both suggested as possible explanations for program mark-ups. However, both amenities and experience proved to be insignificant in the regression analysis. It may be noted, however, that the proportion of space devoted to residential use was an extremely important variable in the analysis. Thus, while the lower proportion of residential space in Section 202/8 projects (about 70% as compared to 80% for other types of Section 8) does not explain the program mark-up, it does account for a 5 percent increase in average per unit costs. By contrast, hidden builder's profit provides a very likely explanation for the hard cost differential. Given a recorded profit rate of 3 percent, it is probable that at least some additional profit is contained in Section 202/8 construction costs.

Chapter 7

FINANCING METHODS AND PROGRAM SUBSIDIES

7.1 Introduction

In previous chapters, variations in development costs were related to variations in project and sponsor characteristics. In this chapter, we determine the extent to which program subsidies are affected by different financial arrangements. In particular, we seek to answer the following questions:

- What are the sources and levels of subsidies to different programs?
- How are subsidies affected by different financing mechanisms?
- To what extent do program subsidies differ with those of unsubsidized (d)4s because of different financial arrangements, and to what extent because of other factors?
- What can the government expect in the future? How are program development costs and subsidies affected by likely future interest rates and inflation, and how are they affected by the new tax law, the Economic Recovery Tax Act of 1981 (ERTA)?

In previous chapters, we noted considerable variation in development costs across the different program variants. There is also significant variation in the source and the level of subsidies received. We find that subsidy variations are most sensitive to financial arrangements; interest rates likely to prevail in the future and the new tax changes have little effect on development costs, and both have a significant effect on the subsidies received by low-income housing programs.

In the next section we define the costs and subsidy concepts used, explain the methodology used to calculate them, and briefly summarize our assumptions, and in Section 7.3 we present our findings. In making assumptions we use those that are mostly widely accepted in the field. However, the reader should note that there are areas in which there is little concensus, and our assumptions may be controversial. Therefore, in Section 7.4 we demonstrate the sensitivity of our findings to the assumptions made. Finally, in Section 7.5 we presnt a summary of findings and conclusions.

7.2 Methodology

The purpose of this section is to define the cost and subsidy concepts used in this analysis, explain how costs and subsidies are estimated, and to present briefly the most important assumptions made for the analysis.

7.2.1 Costs

In this chapter our primary interest in costs is as a means of estimating program subsidies. For this purpose there are two major categories, development costs and annual costs of project operation. Development costs have been discussed at length in previous chapters. For the analysis of program subsidies we start with hard costs from our sample of projects and add profit and soft costs using mark-ups also derived from the sample and from program regulations. The procedures and mark-ups used are presented in more detail in Appendix J.

Annual costs incurred in project operation include loan payments, mortgage insurance premiums for insured mortgages, a return to investor equity, property taxes, utilities, and other operating costs. The levels and sources for these are presented in Appendix I.

7.2.2 Subsidy Definitions

The primary objective of this chapter is to determine who pays the costs of housing for low income households; in particular, how much is paid by various levels of government in the form of subsidies? In fact, this study is unusual in that an attempt is made to include subsidies from federal, state, and local governments; the focus is on costs to the entire public sector.

There are two major categories into which subsdies fall, direct and indirect. Direct subsidies are usually program budget items, and as such are more visible. Indirect subsidies are not program budget items and usually result from tax breaks. We proceed by first describing the types of direct subsidies received and then discussing the various types of indirect subsidies.

Rent Subsidies. The Section 8 program is essentially a rent subsidy program, and the rental subidy is a direct subsidy which makes up the difference between market rents and tenant contributions. The fair market rent is agreed upon by the building owner and the Department of Housing and Urban Development and is based on prevailing rent levels in the local market. The tenant contribution is a fixed percent of household income after deductions for dependents.

Interest Subsidies. Another direct subsidy is an interest subsidy that results when the project owner receives a mortgage loan at an interest rate that is lower than the borrowing cost of the lending agency. In particular, the annual interest subsidy is the difference between the annual mortgage payment necessary to pay off the mortgage at the higher agency borrowing rate and the payments actually made by the project owner. For example, under the 236 program a project owner can receive a mortgage at a subsidized interest rate as low as one percent. However, the loan rate is actually the higher FHA interest rate (nine percent in 1979), the difference being paid by HUD.

Direct interest subsidies are also received by 202/8 housing because project owners receive loans at an interest rate that is an average of federal borrwing rates of all maturities, and this is lower than the long-term treasury borrowing rate. Public Housing receives direct interest subsidies when it is financed through the Federal Financing Bank. Mortgage loans are made to Public Housing authorities at a long-term tax-exempt bond rate, while the Federal Government makes up the difference between this rate and the Federal long-term borrowing rate. (The use of the Federal Financing Bank for Public Housing is discussed below.)

Agency Administrative Costs. Agency administrative costs are direct subsidies due to the costs to HUD of administering the Section 8 program that are not charged to projects. Housing developed under all programs receive these to varying degrees. There are two components, an initial cost incurred in the development stage and annual management costs.

GNMA Tandem Expense. The last direct subsidy is the Government National Mortgage Association (GNMA) Tandem expense. Under the GNMA Tandem program, an institutional lender obtains a commitment from GNMA to purchase a mortgage loan made to finance a housing development for low income households. These developments usually have Section 8 rental contracts, and the mortgage has a 7.5 percent interest rate. GNMA purchases the mortgage at 97.5 percent of the face value and resells it to an investor in the secondary mortgage market. The mortgage is sold at a discount from its face value in order to provide the investor with a competitive rate of return; the loan and principle payments on the 7.5 percent mortgage provide a higher rate of return on the discounted purchase price. The difference between the price paid by GNMA for the mortgage and the price it receives upon resale is an expense borne by the Federal Government, and is a direct subsidy to the housing development.

The next group of subsidies are indirect in that they are not program budget items and usually result from tax breaks. These are currently referred to as tax expenditures and represent taxes foregone by federal, state, and local governments.

Excess Depreciation. One indirect subsidy results from the deduction of excess depreciation by building owners. The use of accelerated depreciation schedules allows owners to take depreciation earlier than if they use the straight-line method; in this case, excess depreciation is defined as the difference between that actually taken and depreciation that would be taken if the straight-line method is used. Note that these indirect subsidies are due only to the timing of deductions and therefore tax payments. Larger deductions sooner mean smaller ones later. However, for any given level of governmental expenditures, larger earlier deductions by building owners imply smaller tax collections, greater governmental borrowing, and therefore greater interest costs to the government. Since the source of tax expenditures from excess depreciation is in their timing, tax expenditures are due to the difference between the present value of accelerated and straight-line depreciation deductions multiplied by the marginal tax rate for building owners.

Expensing Construction Period Interest and Taxes. Another source of indirect subsidies is the expensing of construction period interest and taxes. For low-income housing, interest and taxes incurred during construction can be deducted as an expense when they are incurred. These deductions lower taxable income and therefore taxes paid. In contrast, construction period interest and taxes incurred in the development of housing for middle and upper income households cannot be expensed. It must be amortized over five years for projects built in 1979, or over ten years for projects built in 1984 and after. This means that 20 percent of construction period

taxes and interest are deducted each year after construction when they are amortized over five years, and ten percent is deducted in each year when amortized over ten years.

Again, the indirect subsidies are due only to the timing of the deductions taken. Tax expenditure are the difference between the present value of deductions for construction period interest and taxes when they are expensed and their present value when they are amortized, multiplied by the marginal tax rate of building owners. Note that taxes are also foregone by state governments due to accelerated depreciation and expensing construction period interest and taxes to the extent that states allow these deductions for tax computations.

Local Property Taxes Foregone. Indirect subsidies result when the property taxes paid by a building owner are less than what would be paid for an unsubsidized, privately owned building. These subsidies are borne by local governments and are received by public housing and 202/8 housing. The former receive the subsidies because public housing is owned by an entity of local government. 202/8 housing pays an average of one-fourth of the property taxes paid by other privately owned housing, and this results from such housing being developed by non-profit sponsors.

The Use of Tax-Exempt Bonds. Indirect subsidies result when housing is financed from the proceeds of tax-exempt bonds because the interest paid to bond holders is tax-exempt. The subsidy is the taxes state and federal governments would receive if the money used to buy the tax-exempt bonds were placed instead in taxable investments. Housing built under the 11(b) program, developed through state housing finance agencies, and built by public housing authorities are all financed through tax-exempt securities. However, we should note that the extent to which subsidies result from their use is highly controversial and will be dealt with at length below.

Capital Gains Taxes. Capital gains taxes paid upon sale of a building are an offset to other indirect subsidies; that is, they are a negative subsidy. when a building is sold, there is usually a capital gain. This is the excess of the sale price over the adjusted basis of the building; the adjusted basis is the original value of the depreciable part of the project minus depreciation deductions plus the original value of the land. This excess is taxed at the lower capital gains tax rate and represents payments to state and federal governments.

In all, we distinguish four direct subsidies and five indirect subsidies excluding capital gains taxes. In Table 7-1 we summarize the housing programs and the subsidies each receives. Note that public housing receives both direct interest subsidies and indirect subsidies due to the use of tax-exempt bonds. However, the two subsidies are not received by the same project, at least through mortgage loans. This occurs because the method by which Public Housing is financed changed in 1980.

From mid-1974 through September 1980 Public Housing was financed by the sale of short-term tax-exempt notes to the public, and these are continually being rolled over. As a result, indirect subsidies are received for projects developed during this period. Since September 1980 construction period financing has been obtained by the sale of short-term tax-exempt notes to the public, but long-term (mortgage) financing has been obtained by the sale of long-term bonds to the Federal Financing Bank, an entity in the U.S. Treasury.

By regulation, Public Housing authorities pay 6.6 percent for their long-term financing from the Federal Financing Bank, but the long-term cost of borrowing is much higher for the U.S. Government (about 12 percent in 1980). The difference is the source of a direct interest subsidy to Public Housing authorities.[1]

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[1]We are indebted to Mr. Theodore Daniels of HUD for this information.

Table 7-1

TYPES OF SUBSIDIES RECEIVED BY PROGRAM

Subsidies / Program	Direct Subsidies				Indirect Subsidies				
	Rent	Interest	Agency Admin. Costs	GNMA Tandem	Excess Depreciation	Construction Period Interest	Construction Period Taxes	Local Taxes Foregone	Tax-Exempt Bonds
Section 8									
New Construction									
202	X	X	X					X	
HUD FHA	X		X	X	X	X	X		
11(b) Insured	X		X		X	X	X		X
SHFA FHA	X		X		X	X	X		X
SHFA Uninsured	X		X		X	X	X		X
Substantial Rehabilitation									
HUD FHA	X		X	X	X	X	X		
SHFA FHA	X		X		X	X	X		X
SHFA Uninsured	X		X		X	X	X		X
Public Housing									
Turnkey	X	X	X			X	X	X	X
Conventional	X	X	X					X	X
236 Rent Supplement	X	X	X		X	X	X		
Unsubsidized 221(d)4			X		X				

7.2.3 Three Scenarios

With the aid of a financial model designed by HUD, we analyze three scenarios to determine the levels and sources of subsidies for housing programs for low-income households.[2] The three scenarios were designed to isolate the sources of variation in subsidies across the different housing programs. For each program, they differ by the assumed levels and compositions of the hard costs. In all scenarios the rates for soft costs and profit are the same for a given program, although they vary across programs.

Scenario 1. In this scenario we assume that all programs produce a standard housing unit, which is defined as the average unit in our sample of HUD-processed Section 8 projects.[3] We also assume that the hard costs of constructing that unit are the same for all the programs, and are equal to the costs that would occur under the unsubsidized FHA program (i.e. $22,920). Finally, we assume that utility and "other" annual operating costs are identical. As a result, all differences across programs in total development costs, its components, subsidies, and annual costs are due to differences in financing arrangements across the programs and, to a lesser extent, to differences in program regulations. For example, different financing mechanisms and program regulations cause total development costs to differ because they cause soft costs to differ. This scenario is analagous to a previous study done by the Government Accounting Office.[4]

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[2]This model was developed by David Einhorn to whom we are indebted for his assistance and advice.

[3]This unit is a one bedroom, one bath apartment with 664 square feet of living area in a three story building with from 50 to 100 units.

[4]See GAO, Evaluation of Alternatives for Financing Low and Moderate Income Rental Housing, PAD-80-13.

Scenario 2. In Scenario 2 we assume that the same standard unit is produced by all programs, but we allowed the cost of producing that unit to vary across the programs. The variations in hard costs are derived from the programmatic mark-ups identified in Chapter 5. As noted in that discussion, there are several possible explanations for such mark-ups, including: differences in efficiency across programs, unidentified variations in the average quality of construction, and other unobserved influences that vary systematically across programs. The resulting variations in costs and subsidies in this scenario are the cumulative result of differences in what we shall call "program effects" and differences in financial arrangements across the programs.

Scenario 3. In this scenario the average actual hard costs from our sample of projects are used for each program. These differ because of variations in the average type of housing unit built as well as differences in program efficiency. As a result, variations across programs in costs and subsidies in this scenario represent the combined effects of variations in (1) financial arrangements discussed in Scenario 1, (2) "program effects" discussed in Scenario 2, and (3) the types of housing units built. The subsidies in this scenario represent our best estimates of the actual costs incurred by federal, state, and local governments for the low-income housing programs analyzed.

The analysis is done for two time periods. The first is 1979. In this case we use cost data for projects completed in 1979 and tax laws and interest rates applicable in that year. We are essentially assuming that development costs are incurred and all loan commitments are made in 1979. The second time period is the "future". This is intended to represent our best guess of what will prevail over the next ten to twenty years. In this case we use the same cost data as those used in the 1979 analysis. However, we make assumptions concerning future interest and inflation rates, and the

analysis is done using the changes in the tax law introduced by the Economic Recovery Tax Act of 1981 (ERTA). Under both the "1979" and "future" scenarios, development costs and first year operating costs are stated in 1980 dollars.

ERTA has two major effects on the analysis. First, the depreciation period is shortened from 40 to 15 years thereby increasing the subsidies due to accelerated depreciation. Second, the maximum tax rate on unearned income is lowered from 70 to 50 percent. This decreases the taxes saved by building owners when various deductions are taken and thereby decreases the taxes forgone by the Federal Government.

7.2.4 The Decomposition of Subsidy Variations[5]

As we have seen, the three scenarios progressively allow additional influences to affect costs and subsidies; the first scenario allows only financial (and some programmatic) arrangements to vary; the second allows these and program effects to vary; and the third allows the first two influences and the types of units built to vary. These scenarios are then used to present the independent effects of the three sets of influences.

The overall basis of comparison is the subsidy received by the standard unit when produced in an unsubsidized 221d(4) project. The difference between actual subsidies and those for the standard of comparison is decomposed into three parts. The first is the difference between each program and the standard of comparison due only to financial arrangements. This is obtained by comparing each programs' subsidies in Scenario 1 with those for the unsubsidized d(4) project in this scenario. We call this the financial effect.

The second component isolates the program effects. It is obtained by comparing the subsidies for a program in Scenario 2 with the subsidies of the same program in Scenario 1. The third component isolates the effect of variations in the housing units

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[5]See Appendix J for an algebraic presentation of this decomposition.

produced. It represents the effect of the difference between the average unit produced under a program and the standard unit. This effect is obtained by comparing the subsidies for a program in Scenario 3 to those of the same program in Scenario 2. In effect, this component is the subsidy difference between a program's average housing unit and the standard unit when both are produced under the unsubisidized d(4) variant using the low-income housing program's financial parameters. We shall call this the project effect.

7.2.5 Assumptions

In this section we present an overview of the most important assumptions made for our analysis of program subsidies. A more detailed presentation of the assumption made and the methods of calculating subsidies and costs are presented in Appendix J.

Period of Life-Cycle Analysis. In all cases we analyze the costs and subsidies involved when projects are operated for twenty years. Although housing owned by profit-motivated developers is often sold sooner than this, recent regulations require that Section 8 contracts are written for at least twenty years.

A twenty year holding period is also assumed for 202/8 and Public Housing projects. This assumption enables us to derive comparable estimates of "life-cycle" costs and subsidies for all programs. It also simplifies the analysis somewhat, since it eliminates the need for assumptions regarding the use of projects after sale for profit-motivated owners and the need to consider major renovations that are often necessary for Public Housing after the first twenty years of operation. In any event, we relax this assumption at the end of the chapter to determine how sensitive the results are to it. In particular, we consider the effect of the sale and resyndication of projects after seven years and the effect of using a forty year period for Public Housing.

Gross Rent. An important assumption in this study is that gross rent equals annual operating costs including the loan payment. We do this, for two reasons. First, we do not have information on the first year's fair market rents or subsequent annual increases allowed for projects. Second, the rents calculated here represent what is required to cover project costs, and in the future scenarios they represent what the government should expect if housing for low income households is to be built.

Tenant Contribution. The household used for our analysis is an elderly couple with an initial income of $5,000. Adjusted income is obtained by subtracting a $300 deduction for an elderly household, and the tenant contribution is 30 percent of adjusted income [(0.30)(4,700) = 1,410 in the first year].[6]

Although not all programs concentrate on the elderly, most non-202 Section 8 units are elderly units. As we note in Chapter 4, from 52 to 63 percent of our sample of new construction projects are for the elderly, and holding the type of tenant households constant allows us to isolate the effects of financial and other programmatic factors on costs and subsidies.

Inflation and Interest Rates. Three components of annual costs are allowed to vary over time with inflation: utility costs, other operating costs, and property taxes. Based on the long-term forecasts of two leading forecasters, we assume that the average rate of inflation over the next ten to fifteen years is seven

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[6]The 30 percent contribution and $300 deduction are in the regulations proposed to implement the Budget Reconciliation Act of 1981. Income is estimated from U.S. Department of Housing and Urban Development, Participation and Benefits in the Urban Section 8 Program, Vol. I (January 1981).

percent.[7] We assume that utility and other operating costs increase annually at this rate, and that property taxes increase at an annual rate of 5.4 percent. This is the net effect of a seven percent inflation rate in property values--assumed to equal the general inflation rate--and a real depreciation rate of 1.5 percent for apartment buildings.[8] We also assume that tenant income and contributions to rent increase at seven percent.

For the 1979 scenarios published 1979 interest rates are used, and these are presented in Appendix J. The analysis of housing costs for the "future" is intended to provide an idea of costs the U.S. Government is likely to encounter in the future. Two assumptions underly the interest rates we use for the scenarios: the after tax real rate of return to capital is four percent, and the inflation rate is seven percent.[9] On this basis we assume that the long-term rate on U.S. bonds is 11 percent, and almost all other

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[7]DRI forecasts an average increase in the GNP deflator of 7.4 percent from 1981 to 1995; DRI, The Data Resources U.S. Long Term Review, Summer 1981. Evans Economics forecasts the average increase in the GNP deflator of 6.7 percent from 1981 to 1990; Evans Economics, Inc., First Quarter 1981. The average of these two is 7.0 percent.

[8]This is derived from unpublished material supporting Charles R. Hulten and Frank Wykoff, "The Estimation of Economic Depreciation Using Vintage Asset Prices: An Application of the Box-Cox Power Transformation." Journal of Econometrics, 15 (1981), pp. 367-396. Note that (1.07)(0.985) = 1.054.

[9]See Alan J. Auerbach and Dale W. Jorgenson, "Inflation-proof Depreciation of Assets," Harvard Business Review, September-October 1980, and references cited therein for the real rate. Our assumption of a seven percent inflation rate is discussed above.

rates are based on their historical relationship to this rate. For both the 1979 and future scenarios we use a discount rate of 11 percent.

The average inflation rates used may differ from those which actually prevail over the next 10 to 20 years; no one can accurately predict the future, and errors in economic forecasts are well known. If different inflation rates prevail, the levels of costs and subsidies for the housing programs will be affected, but their relative magnitudes will not. Inflation affects all of the programs similarly.

The Marginal Tax Rate of Building Owners. A common rule of thumb in the real estate industry is that investors in Section 8 housing should have marginal tax rates of about 50 percent or higher. For the 1979 scenarios we use a Federal tax rate of 60 percent as an average of that for investors. For the future scenarios we use 50 percent, because the top tax brackets on unearned income have been lowered to this level under ERTA. Taking into account state taxation, we use an overall tax rate of 63 percent for 1979 and 54 percent for the future.

Note that in using one tax rate for a scenario we are not assuming that all projects are owned by a single individual. It is well known that Section 8 projects are often syndicated; that is, often a project is owned by a group of individuals in a limited partnership. Our findings are not affected by the number of and legal arrangements between project investors as long as personal income tax rates are applicable. Therefore, our results hold whether projects are owned by individuals or whether they are syndicated as long as the tax rates we use represent the average for investors in Section 8 projects.

Foregone Taxes Due to Tax-Exempt Bonds. To determine the foregone taxes due to the use of tax-exempt bonds, we must assume a tax rate for the holders of these bonds. This is highly controversial, and the assumptions we make are no exception.

Assuming an income tax rate for the analysis of tax expenditures implies assuming who buys new tax-exempt bond issues and what portfolio adjustments are made by all investors. There are three basic positions. The first, and simplest, is that tax-exempt bonds are purchased by "marginal" purchasers for whom the after tax rate of return is just the same for tax-exempt and taxable bonds, and tax-exempt purchases are made at the expense of purchases of taxable investments. For example, historically the tax-exempt interest rate has been about 70 percent of the interest rate on taxable bonds. If the rate is seven percent and the taxable rate is ten percent, then an investor in the 30 percent marginal tax bracket would receive the same after-tax return on both. The foregone taxes are those that would be paid by taxpayers in the 30 percent marginal bracket if they had purchased taxable bonds.

The second position is that purchases of tax-exempts are usually made by investors in high marginal brackets, and purchases are made at the expense of investments in equity and other assets with varying degrees of tax sheltering. Proponents of this position argue that the tax rate should be low for calculating foregone taxes, and Kormendi and Nagle estimate that this should be about 15 percent.[10]

The third position is that investors in all tax brackets make portfolio adjustments when new tax-exempt bonds are issued. One variant suggests that purchases are made by individuals in a wide

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[10]See Roger C. Kormendi and Thomas T. Nagle, "The Interest Rate and Tax Revenue Effects of Mortgage Revenue Bonds," Unpublished manuscript, The University of Chicago Graduate School of Business, July 26, 1979. Table III, p. 16.

range of brackets, and these purchases are at the expense of taxable investments. For example, the Treasury has used an average marginal rate of 42 percent for the holders of tax-exempts, and this rate was used by the GAO in its study of alternatives for financing low and moderate income rental housing.[11] George Peterson and Brian Cooper suggest using a lower rate, 35 percent. Another variant of this argument is that when new tax-exempt bonds are sold, a sequence of portfolio adjustments is set in motion. First, higher income investors buy these bonds and pay for them by selling other sheltered investments such as stocks. The new purchasers of the stocks sell another type of asset, and this sequence continues until the last investor makes his or her purchase at the expense of not purchasing a taxable bond. Therefore, purchases of tax-exempt bonds are ultimately made at the expense of taxable investments, and the effective tax rate is somewhat higher than that of the marginal purchaser. This occurs because each transaction in the sequence involves buying a more sheltered asset by selling a less sheltered one, and therefore each transaction involves some loss to the government.[12]

In this study we adopt the position of the Treasury and GAO and use a federal tax rate of 42 percent for the 1979 scenarios and tax rate of 34 percent for the "future" scenario. The latter figure is derived from a distribution presented by Peterson and Cooper taking into account the decreased rates on unearned income under the new tax law. This results in tax rates of 46 and 38 percent,

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[11]See GAO, Op. cit.

[12]See A. Thomas King, "An Evaluation of Tax-Exempt Financing for Housing." Staff Paper prepared for the Presidents Commission on Housing (draft), November 1981.

respectively, taking into account state income taxation.[13] However, we calculate the effect of alternative tax rates to determine the sensitivity of our results to this assumption.

The Tax-Exempt Bond Rate in the Future. State and local tax exempt bonds historically have been about 70 percent of taxable bonds. In our "future" scenario we assume that they are 75 percent of the triple-A corporate bond rate, implying a base tax exempt rate of 8.1 percent. We believe that there are several reasons for this narrowing of the differential between taxable and tax exempt rates; the maximum federal tax rate on unearned income has been decreased to 50 percent, all-savers certificates compete for tax exempt investments, there has been an increasing trend in the use of tax exempts for housing, and the rating of state and local bonds may decline due to the pressure on these governments from tax limitation movements and decreased federal aid.

In effect, we make this assumption for the long run in a stable environment, and we do not view current conditions as representative of the future. At this writing, tax-exempt bond rates are over 80 percent of that for triple-A corporate bonds, and it has been over 80 percent within the last year. Also, short-term rates on Treasury bills and notes are almost equal to rates paid on long-term Treasury bonds. This has traditionally occurred when interest rates are high and there has been financial disintermediation.

Project Failure. The final issue to be dealt with in this section is that of the costs of project failure. Due to the absence of appropriate data our analysis does not consider the implications of differential rates of project failure across the different programs. Several studies have used the experience of 207 and 236

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[13] See George Peterson and Brian Cooper, Tax Exempt Financing of Housing Investment. The Urban Institute, 1979, p. 120. See Appendix J for the calculation of overall income tax rates from state and federal rates.

projects to estimate failure rates, the most notable being the GAO study of financing alternatives for low-income rental housing.[14] However, this study estimated the costs of failure only for FHA insured projects. It did not do so for uninsured 11(b) and SHFA projects because of a lack of data. Public Housing was also not included because few or no failures have occurred.

The omissions of 11(b) and SHFA projects are reasonable in the GAO study because it dealt only with the effect of financial factors (our Scenario 1) and these projects were more expensive than others even without including the costs of failure. However, we are interested in the levels and variations in costs and subsidies when other factors are allowed to vary (Scenarios 2 and 3).

We have rejected the GAO approach for several reasons. In discussions with knowledgeable individuals both in and outside of HUD, we fould general agreement that 236/207 experience is not comparable to that of the Section 8 program because the Section 8 subsidy is much deeper. Also, treating Public Housing as having no failures is misleading because of special funds for renovation and for rescuing troubled projects. Finally, we are interested in cost and subsidy variations when factors other than financial arrangements vary, and we want to deal with the different programs on an equivalent basis. We do not underestimate the importance of the effects of failure on program costs. But data availability precludes us from dealing with it in a satisfactory way.

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[14]GAO, op. cit. The National Housing Law Project in Berkeley uses the GAO figures in the report Cost Analysis of Financial Alternatives for Distressed Projects, July 1979. Other studies using the 207 experience are Thomas N. Herzog, "Construction of Survivorship Schedules for FHA-Insured Project Mortgages," unpublished manuscript, March 1981; Larry T. Frazier and Michael K. Stamper, "A More accurate Method is Developed for estimating value," The Mortgage Banker, December 1978.

7.3 Development Costs, Financing Costs, and Subsidies: Findings

In this section we present the results of the analysis of subsidies for low-income housing programs. Although the analysis is done for 1979 and future scenarios, we report primarily the results for 1979; the purpose is to keep the presentation concise. Although subsidies vary quantitatively between the 1979 and future scenarios, the comparative results do not. However, we do report the results of Scenario 2 for the "future"; Scenario 2 assumes that the same standard unit is produced by all programs, but efficiency differences cause hard costs to vary. This allows comparisons between 1979 and the future, and it provides a basis for estimating the program costs and subsidies the government can expect allowing for differences in "efficiency" while standardizing for the type of unit constructed.

First, the results of Scenario 1 for 1979 are presented. These indicate the effect of financial arrangements and programmatic regulations on subsidies. Next, the findings for Scenarios 2 and 3 are presented. Then the results for 1979 are summarized by decomposing the difference between subsidies for actual average projects (Scenario 3) and those for the standard unit under the unsubsidized 221d(4) program. We conclude with the results of Scenario 2 for the "future" assumptions.

Before proceeding, we should point out that operating costs and subsidies are presented as "annual" amounts. These are not simple annual averages, but are like payments on an annuity. The point to emphasize here is that the annual quantities presented in the tables below may not be comparable to those in other studies. Their interpretation and method of calculation are presented in Section J.5 in Appendix J, and measures comparable to other studies can easily be obtained.

7.3.1 Scenario 1: The Impact of Financial Factors

In Scenario 1 we assume all programs produce the same standard housing unit at the same hard costs. Therefore, all variations in development costs are due to variations in soft costs; and variations across programs in subsidies are due to differences in costs and program regulations that reflect the financing mechanisms.

Total Development costs, the percent mortgaged, and the mortgage interest rate are presented in Table 7-2.[15] Direct, indirect, total subsidies, and direct subsidies as a percent of the total are presented in Table 7-3.

By both absolute and relative measures, all low-income housing programs receive substantial subsidies. Annual subsidies vary from about $3,100 to $5,600 per unit, and subsidies vary from half to almost three-fourths of costs. This is in marked contrast to unsubsidized projects.

Unsubsidized 221(d)4 projects receive practically no subsidies, and the indirect subsidies due to excess depreciation are completely offset by capital gains taxes received upon sale.[16] Among low income housing programs, 202s receive the smallest subsidy. The next lowest is received by conventional Public Housing, followed by Turnkey projects.

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[15]A more detailed breakdown in presented in Appendix I.

[16]The low capital gains taxes for these projects compared to others occur because excess depreciation taxed at ordinary income tax rates (recaptured) are excluded. The latter are reflected in lower indirect subsidies due to excess depreciation for 221(d)4s. See Appendix I.

The subsidy increases somewhat in the future scenario under the new tax law (ERTA) due to faster depreciation writeoffs. But the increase is small compared to that for other programs.

Table 7-2

TOTAL DEVELOPMENT COST, PERCENT MORTGAGED,
AND MORTGAGE INTEREST RATE, SCENARIO 1, 1979

Program	Total Development Costs ($)	Percent Mortgaged (%)	Mortgage Interest Rate (%)
Section 8			
New Construction			
202	$26,152	100%	7.875%
HUD FHA, GNMA Tandem	30,093	90	7.5
11(b) Insured	28,695	90	7.35
SHFA FHA	28,947	90	8.10
SHFA Uninsured	27,680	90	8.85
Substantial Rehabilitation			
HUD FHA, GNMA Tandem	29,630	90	7.5
SHFA FHA	28,735	90	8.10
SHFA Uninsured	27,579	90	8.85
Public Housing			
Turnkey	27,450	100	6.3
Conventional	25,641	100	6.3
236 Rent Supplement	29,888	90	9.0
Unsubsidized 221(d)4	30,061	90	9.0

Table 7-3

ANNUAL* DIRECT, INDIRECT AND TOTAL SUBSIDIES.
SCENARIO 1. 1979.

Program	Direct Subsidies ($)	Indirect Subsidies ($)	Total Subsidies ($)	Direct as % of Total Subsidies (%)
Section 8				
New Construction				
202	2,934	183	3,117	94.1%
HUD FHA, GNMA Tandem	4,241	68	4,309	98.4
11(b) Insured	3,253	1,290	4,543	71.6
SHFA FHA	3,572	1,355	4,927	72.5
SHFA Uninsured	3,481	1,304	4,785	72.7
Substantial Rehabilitation[1]				
HUD FHA, GNMA Tandem	4,195	735	4,930	85.1
SHFA FHA	3,560	2,014	5,574	63.9
SHFA Uninsured	3,473	1,890	5,363	64.8
Public Housing				
Turnkey	2,179	1,574	3,753	58.1
Conventional	2,055	1,521	3,576	57.5
236 Rent Supplement	3,943	68	4,011	98.3
Unsubsidized 221(d)4	65	2	67	97.0

* Annual amounts equal the constant annual payment from a 20-year annuity valued at the present value of subsidies and paying an interest rate equal to the discount rate, 11 percent. See Appendix J.

[1]Assumes 167(k) depreciation.

The largest subsidies are received by state processed substantial rehabilitation projects using the special five-year writeoff, Section 167(k) depreciation. Under this section of the Internal Revenue Code, owners of buildings rehabilitated for renting to low-income households can depreciate up to $20,000 per unit of rehabilitation expenses over a five year period using straight-line depreciation. In contrast, in 1979 owners of new buildings could use at best double-declining balance depreciation over about 40 years. The subsidies received by other programs are fairly constant and fall between Public Housing and state substantial rehabilitation using 167(k) depreciation.

Subsidies are low for 202 housing because both its direct and indirect subsidies are low, and those for Public Housing are low because of low direct subsidies. Both 202 and Public Housing have low direct subsidies because they both require low rent subsidies; they pay no return on equity, no mortgage insurance premiums, and their property tax payments are lower than those for buildings in other programs. In addition, loan payments are low for Public Housing because these projects have low interest rates on their mortgage loans.

Indirect subsidies for 202s and Public Housing are low because indirect subsidies due to excess depreciation and the deduction of construction period interest and taxes (except for Turnkey) are negative. This can occur because of the way these are defined.

Excess depreciation is defined as the present value of the difference between depreciation deductions taken and those that would be taken if straight-line depreciation over 40 years is used. Similarly, deductions for construction period interest and taxes are defined as the present value of the difference between those taken by a project and those that would be taken if the project were built as an unsubsidized (d)4. Since sponsors of 202s and Public Housing authorities take neither type of deduction for tax purposes,

indirect subsidies are negative. However, indirect subsidies received by Public Housing projects are not as low as those received by 202s because of the large subsidies due to the use of tax-exempt bonds when these are sold to the public.

Large subsidies for rehab projects using 167(k) result from the special five year writeoff. Forgone taxes when 167(k) is used are over 4.5 times larger, or about $700 more per year, than if the double declining balance method is used over a 40 year building life. Indirect subsidies are increased even more for SHFA rehab projects because of the use of tax exempt bonds to finance their mortgages.

In all programs direct subsidies are over half of the total. However, direct subsidies are the smallest proportion of the total for programs using tax-exempt bonds to finance mortgage loans because these are the source of substantial indirect subsidies. In contrast, in programs that do not use tax-exempts, direct subsidies are usually over 90 percent of the total (see Table 7-3).

The previous discussion emphasizes the absolute levels of annual subsidies. These are affected to some extent by the level of total development and operating costs. One indication of the relationship of subsidies to project costs is the proportion of costs covered by subsidies. For this a different measure of total cost is needed.

Subsidies occur during development and annually during operation. Also, the total resource cost of a project is the sum of the total development cost and annual operating costs. Therefore, a measure of total project costs is needed that includes both. The measure used is annual total project cost, and it is the sum of total development costs stated on an annual basis and annual operating costs net of loan payments.

Annual development cost is obtained by calculating the annual payment on a 40 year mortgage equal to total development cost at an interest rate equal to the discount rate (11 percent). Forty years is the assumed life for all projects, and although our analysis stops at 20 years, we assume that project services continue. Annual operating costs are obtained by subtracting annual loan payments from gross rent. Loan payments are omitted to eliminate double counting since they cover either 90 percent or all of development costs depending on the program. In addition, annual property tax payments included in the operating costs of Public Housing and 202s are increased to what they would be if the buildings were owned by private, profit-motivated sponsors. We do this because we want the total value of the resources used in developing and operating the projects over their lifetime, stated on an annual basis. We are assuming that property taxes represent payments for goods and services received, and Public Housing and 202 projects receive these even if their property tax payments are lower.

State rehab projects using 167(k) depreciation receive the highest subsidies relative to costs, about 80 percent. About two-thirds of costs are subsidized for 11(b) and 70 percent for SHFA new construction and HUD processed rehabilitation. Between 55 and 60 percent of costs are subsidized for GNMA Tandem, 236 and Public Housing projects. Finally, 202s receive the lowest relative subsidies with about 49 percent of costs subsidized. Relative subsidies are presented in Table 7-4.

7.3.2 Scenarios 2 and 3: The Impact of Program and Project Factors

Scenarios 2 and 3 differ from Scenario 1 in the assumed hard costs. In Scenario 2 all programs produce the same housing unit, the standard unit, but hard costs vary due to differences in "efficiency." In Scenario 3 hard costs vary because both the

Table 7-4

ANNUAL TOTAL PROJECT COSTS, SUBSIDIES AND SUBSIDIES AS A PERCENT OF COSTS. SCENARIO 1. 1979.

Program	Annual Development Costs ($)	Annual Operating Costs Excluding Loan Payments ($)	Total Annual Costs* ($)	Annual Subsidies ($)	Subsidies as a % of Costs (%)
Section 8					
New Construction					
202	2,922	3,421	6,343	3,117	49.1%
HUD FHA, GNMA Tandem	3,362	3,824	7,186	4,309	60.0
11(b) Insured	3,206	3,517	6,723	4,543	67.6
SHFA FHA	3,234	3,809	7,043	4,927	70.0
SHFA Uninsured	3,092	3,671	6,763	4,785	70.8
Substantial Rehabilitation					
HUD FHA, GNMA Tandem	3,310	3,819	7,129	4,930	69.1
SHFA FHA	3,210	3,805	7,015	5,574	79.5
SHFA Uninsured	3,081	3,670	6,751	5,363	79.4
Public Housing					
Turnkey	3,067	3,394	6,461	3,753	58.1
Conventional	2,865	3,430	6,295	3,576	56.8
236 Rent Supplement	3,339	3,823	7,162	4,011	56.0
Unsubsidized 221(d)4	3,358	3,525	6,883	67	1.0

*This is the annual gross rent that would be needed to cover costs if all projects received a mortgage of 100% of Total Development Costs at the discount rate (11%), and all projects were subject to a 2% property tax rate.

average housing unit produced varies by program and efficiency varies. Development costs for Scenarios 2 and 3 are presented in Table 7-5 and subsidies are presented in Tables 7-6 to 7-9.

The highest subsidies are received by uninsured SHFA rehabilitation projects followed closely by Turnkey Public Housing. The increased subsidies for Public Housing are due primarily to increased development costs. The lowest subsidies continue to be received by 202 housing in spite of the marked increase in development costs. This program still benefits from relatively low rent subsidies because of low property taxes, no mortgage insurance premiums, and no payment on investor equity. Indirect subsidies are low for 202s because of the negative contributions of subsidies from excess depreciation and expensing construction period interest and taxes.

202s are followed by 236 and HUD processed rehabilitation projects. These projects receive low subsidies primarily because of low indirect subsidies; they do not use tax-exempt bonds or receive breaks on their property tax bill.

Subsidies as a percent of total costs increase for all programs from Scenario 1 to Scenario 3, and these increases are modest except for Public Housing. In this case the increases are fairly large, and subsidies are two-thirds of costs. The highest relative subsidies are received by state rehabilitation projects, especially uninsured projects for which 86 percent of costs are subsidized.

7.3.3 Decomposition of Subsidy Variations

As we noted in the previous section, the program differences in subsidies observed in Scenario 1 vary significantly from those in Scenario 3. The purpose of this section is to identify the sources of the differences between the two scenarios.

For each program the differences between its actual subsidies (those presented in Scenario 3) and the subsidies received for the standard unit produced in an unsubsidized 221d(4) project are

Table 7-5

TOTAL DEVELOPMENT COST. SCENARIO 2
AND SCENARIO 3. 1979.

Program	Scenario 2 Dev. Costs ($)	Scenario 3 Dev. Costs ($)
Section 8		
New Construction		
202	33,039	33,907
HUD FHA, GNMA Tandem	33,070	32,758
11(b) Insured	30,041	32,053
SHFA FHA	33,357	32,550
SHFA Uninsured	32,082	32,107
Substantial Rehabilitation		
HUD FHA, GNMA Tandem	27,323	31,611
SHFA FHA	27,858	30,484
SHFA Uninsured	31,781	38,062
Public Housing		
Turnkey	44,104	45,630
Conventional	38,063	42,722
236 Rent Supplement	32,118	34,185
Unsubsidized 221(d)4	30,069	31,108

Table 7-6

ANNUAL* DIRECT, INDIRECT AND TOTAL SUBSIDIES,
SCENARIO 2. 1979.

Program	Direct Subsidies ($)	Indirect Subsidies ($)	Total Subsidies ($)	Direct as % of Total Subsidies (%)
Section 8				
New Construction				
202	3,634	176	3,810	95.4%
HUD FHA, GNMA Tandem	4,632	77	4,709	98.4
11(b) Insured	3,700	1,357	5,057	73.2
SHFA FHA	4,090	1,566	5,656	72.3
SHFA Uninsured	4,003	1,513	5,516	72.6
Substantial Rehabilitation[1]				
HUD FHA, GNMA Tandem	3,885	714	4,599	84.5
SHFA FHA	3,460	1,973	5,433	63.7
SHFA Uninsured	3,968	2,168	6,136	64.7
Public Housing				
Turnkey	3,320	2,512	5,832	56.9
Conventional	2,096	2,257	5,163	56.3
236 Rent Supplement	4,227	80	4,307	98.1
Unsubsidized 221(d)4	65	3	68	95.6

* Annual amounts equal the constant annual payment from a 20-year annuity valued at the present value of subsidies and paying an interest rate equal to the discount rate, 11 percent. See Appendix J.

[1]Assumes 167(k) depreciation.

Table 7-7

ANNUAL TOTAL PROJECT COSTS, SUBSIDIES, AND SUBSIDIES AS A PERCENT OF COST. SCENARIO 2. 1979.

Program	Annual Development Costs ($)	Annual Operating Costs Excluding Loan Payment ($)	Total Annual Costs* ($)	Annual Subsidies ($)	Subsidies as a % of Costs (%)
Section 8					
New Construction					
202	3,691	3,583	7,274	3,810	52.4%
HUD FHA, GNMA Tandem	3,695	3,947	7,642	4,709	61.6
11(b) Insured	3,356	3,857	7,213	5,057	70.1
SHFA FHA	3,727	3,993	7,720	5,656	73.3
SHFA Uninsured	3,584	3,831	7,415	5,516	74.4
Substantial Rehabilitation					
HUD FHA, GNMA Tandem	3,052	3,718	6,770	4,599	67.9
SHFA FHA	3,112	3,772	6,884	5,433	78.9
SHFA Uninsured	3,551	3,820	7,371	6,136	83.2
Public Housing					
Turnkey	4,927	3,802	8,729	5,832	66.8
Conventional	4,252	3,770	8,022	5,163	64.4
236 Rent Supplement	3,588	3,921	7,509	4,307	57.4
Unsubsidized 221(d)4	3,359	3,827	7,186	68	0.9

* This is the annual gross rent that would be needed to cover costs if all projects received a mortgage of 100% of Total Development Costs at the discount rate (11%), and all projects were subject to a 2% property tax rate.

Table 7-8

ANNUAL* DIRECT, INDIRECT, AND TOTAL SUBSIDIES.
SCENARIO 3. 1979.

Program	Direct Subsidies ($)	Indirect Subsidies ($)	Total Subsidies ($)	Direct as a % of Total Subsidies (%)
Section 8				
New Construction				
202	3,725	182	3,907	95.3%
HUD FHA, GNMA Tandem	4,592	76	4,668	98.4
11(b) Insured	3,933	1,451	5,384	73.0
SHFA FHA	3,997	1,528	5,525	72.3
SHFA Uninsured	4,006	1,514	5,520	72.6
Substantial Rehabilitation[1]				
HUD FHA, GNMA Tandem	4,450	742	5,192	85.7
SHFA FHA	3,770	2,099	5,869	64.2
SHFA Uninsured	4,725	2,468	7,193	65.7
Public Housing				
Turnkey	3,425	2,602	6,027	56.8
Conventional	3,226	2,631	5,857	55.1
236 Rent Supplement	4,484	86	4,570	98.1
Unsubsidized 221(d)4	65	3	68	95.6

* Annual amounts equal the constant annual payment from a 20-year annuity valued at the present value of subsidies and paying an interest rate equal to the discount rate, 11 percent. See Appendix J.

[1]Assumes 167(k) depreciation.

Table 7-9

ANNUAL* TOTAL PROJECT COSTS, SUBSIDIES, AND SUBSIDIES AS A PERCENT OF COSTS. SCENARIO 3. 1979.

Program	Annual Development Costs ($)	Annual Operating Costs Excluding Loan Payments ($)	Total Annual Costs** ($)	Annual Subsidies Costs ($)	Subsidies as a % of Costs (%)
Section 8					
New Construction					
202	3,788	3,612	7,400	3,907	52.8%
HUD FHA, GNMA Tandem	3,560	3,935	7,495	4,668	62.2
11(b) Insured	3,581	3,942	7,523	5,384	71.6
SHFA FHA	3,636	3,960	7,596	5,525	72.7
SHFA Uninsured	3,587	3,832	7,419	5,520	74.4
Substantial Rehabilitation[1]					
HUD FHA, GNMA Tandem	3,532	3,895	7,427	5,192	69.9
SHFA FHA	3,406	3,883	7,289	5,869	80.5
SHFA Uninsured	4,252	4,062	8,314	7,193	86.5
Public Housing					
Turnkey	5,098	3,844	8,942	6,027	67.4
Conventional	4,773	4,006	8,779	5,857	66.7
236 Rent Supplement	3,819	4,006	7,825	4,570	58.4
Unsubsidized 221(d)4	3,475	3,868	7,343	68	0.9

* Annual amounts equal the constant annual payment from a 20-year annuity valued at the present value of subsidies and paying an interest rate equal to the discount rate, 11 percent. See Appendix J.

** This is the annual gross rent that would be needed to cover costs if all projects received a mortgage of 100% of Total Development Costs at the discount rate (11%), and all projects were subject to a 2% property tax rate.

[1] Assumes 167(k) depreciation.

decomposed into three parts: (1) differences due to financial factors; (2) program differences due to "efficiency" factors; and (3) differences due to project or housing unit variations. These are presented in Table 7-10. At this point we should reiterate that the so-called "efficiency" or program factors really represent several possible influences. They can represent unobserved variations in the quality of construction across programs, actual differences in efficiency, and other influences that vary systematically across programs.

With three exceptions, from 80 to 90 percent of the difference in subsidies compared to the 221(d)4 standard unit is due to financial effects. The exceptions are Turnkey and Conventional Public Housing for which about 60 percent of the difference is due to financial effects, and state uninsured rehabilitation for which about 75 percent of the difference is due to financial factors. For Public Housing, most of the remainder is due to program (efficiency) effects, and for state uninsured rehabilitation the remainder is about evenly split between program and project effects. The large influence of program factors on the variation in subsidies for Public Housing is undoubtedly due to their large effect on variations in total development costs. They account for from 98 to 107 percent of development cost differences between Public Housing projects in Scenario 3 and the development costs of the standard unit in an unsubsidized 221(d)4 project. This affects subsidies through increased rent subsidies and foregone local property taxes. The effect of project differences is always small; the largest proportion of the subsidy difference due to these is 15 percent for uninsured SHFA rehabilitation.

7.3.4 The Future

We now turn to the future. The effect of assumptions about the future are analyzed for Scenario 2. The purpose is to determine the

Table 7-10

PERCENTAGE DECOMPOSITION OF DIFFERENCE BETWEEN ACTUAL ANNUAL PROGRAM SUBSIDIES AND THOSE FOR THE STANDARD UNIT BUILT UNDER 221(d)4. 1979.

Program	Financial Difference[1] (%)	Program (Efficiency) Difference[2] (%)	Project Difference[3] (%)	Total Difference (%)	Total Difference[4] (%)
Section 8					
New Construction					
202	79.4%	18.0%	2.5%	100.0%	$3,840
HUD FHA, GNMA Tandem	92.2	8.7	-0.9	100.0	4,601
11(b). Insured	84.2	9.7	6.2	100.0	5,317
SHFA FHA	89.0	13.4	-2.4	100.0	5,458
SHFA Uninsured	86.5	13.4	0.1	100.0	5,453
Substantial Rehabilitation					
HUD FHA, GNMA Tandem	94.9	-6.5	11.6	100.0	5,125
SHFA FHA	94.9	-2.4	7.5	100.0	5,802
SHFA Uninsured	74.3	10.8	14.8	100.0	7,126
Public Housing					
Turnkey	61.8	34.9	3.3	100.0	5,960
Conventional	60.6	27.4	12.0	100.0	5,790
236 Rent Supplement	87.6	6.6	5.8	100.0	4,503

1 Difference between the annual subsidy for each program and that for 221(d)4 in Scenario 1.

2 Difference between the annual subsidy for each program in Scenario 2 and that for the same program in Scenario 1.

3 Difference between the annual subsidy for each program in Scenario 3 and that for the same program in Scenario 2.

4 Difference between the annual subsidy for each program in Scenario 3 and that for 221(d)4 in Scenario 1.

effects of probable changes in interest rates and actual changes in the tax law introduced by ERTA on program costs and subsidies.

The hard costs are the same as those used in Scenario 2 for 1979; the standard housing unit is built by all programs, but hard costs can vary due to differences in "efficiency." Therefore, all differences in costs and subsidies between the future and 1979 in this scenario are due to differences in interest rates and the tax law.

The primary differences between the 1979 and future scenarios are in (1) the interest rates and (2) the tax law. Interest rates assumed for the future are higher than those prevailing in 1979, and the tax provisions of the Economic Recovery Tax Act of 1981 (ERTA) are assumed.

As we have already mentioned, the major provisions of the new law affecting our analysis are the shortened depreciation period for buildings and the lower maximum tax rate on unearned income. Under ERTA buildings can be depreciated using the double-declining balance method with a switch to straight-line using a depreciation period of 15 years if the building is rented to low-income households. For other rental housing such as unsubsidized 221d(4) projects, buildings are depreciated over 15 years using the 175 percent declining balance method with a switch to straight line. In contrast, all rental housing is depreciated over 40 years using the double-declining balance method in the 1979 scenarios.

Under ERTA the maximum tax rate on unearned income is lowered to 50 percent from 70 percent. As a result, we use a marginal tax rate for project owners of 54 percent including state taxation, down from 63 percent for the 1979 scenarios. Finally, the marginal tax rate for purchasers of tax-exempt bonds is decreased to 38 percent for the future compared to 46 percent for 1979. Again, these rates include the effects of state taxation.

If our assumptions about the future are reasonable, the costs and subsidies presented here will be indicative of what the government can expect from different programs in the future except for variations in the type of housing developed. The results are presented in Tables 7-11 to 7-13.

There is little difference between total development costs in 1979 and the future. Development costs in the future are slightly higher because of higher interest rates on construction loans; otherwise, our findings are nearly identical to those for 1979. In contrast, there are significant differences in subsidies from 1979. For all programs, there are marked increases in total subsidies, including unsubsidized (d)4 projects. For all programs taking depreciation deductions, indirect subsidies increase significantly as a result of the shorter 15 year depreciation period. Annual tax expenditures (i.e., indirect subsidies due to depreciation deductions) increase about $450 per housing unit, or by about two and a half times. The major exception is rehabilitation projects using 167(k) depreciation. The five-year writeoff was not changed by the new law, and only a very small proportion of the depreciable base is affected by the change. In fact, indirect subsidies due to excess depreciation when 167(k) is used actually decrease slightly; they are from $10 to $70 less per year than in 1979. This occurs because the tax rate for building owners decreases to 54 percent from the 1979 rate of 63 percent. As a result, deductions save less in taxes for project owners. The advantage of using 167(k) is also much smaller. In the "future" the advantage of using 167(k) instead of double declinng balance depreciation over 15 years is about $235 per year. In 1979 the annual savings in taxes due to 167(k) when the depreciation period was 40 years is $600.

For all subsidized programs rent subsidies increase because of higher development costs, higher interest rates, and consequently higher loan payments. For 236 and 202 projects direct subsidies increase because of the greater spread between unsubsidized and

Table 7-11

TOTAL DEVELOPMENT COSTS, PERCENT MORTGAGED, AND MORTGAGE INTEREST RATE. SCENARIO 2. FUTURE.

Program	Total Development Costs ($)	Percent Mortgaged (%)	Mortgage Interest Rate (%)
Section 8			
New Construction			
202	33,338	100%	9.25%
HUD FHA, GNMA Tandem	33,482	90	7.5
11(b) Insured	30,303	90	9.0
SHFA FHA	33,644	90	9.0
SHFA Uninsured	32,344	90	9.75
Substantial Rehabilitation			
HUD FHA, GNMA Tandem	27,656	90	7.5
SHFA FHA	28,103	90	9.0
SHFA Uninsured	32,075	90	9.75
Public Housing[1]			
Turnkey	44,643	100	6.6
Conventional	38,222	100	6.6
236 Rent Supplement	32,508	90	1.0
Unsubsidized 221(d)4	30,435	90	13.0

[1]Long-Term financing from the Federal Financing Bank.

Table 7-12

ANNUAL* DIRECT, INDIRECT AND TOTAL SUBSIDIES.
SCENARIO 2. FUTURE.

Program	Direct Subsidies ($)	Indirect Subsidies ($)	Total Subsidies ($)	Direct as % of Total Subsidies (%)
Section 8				
New Construction				
202	4,207	262	4,469	94.1%
HUD FHA, GNMA Tandem	5,175	553	5,726	90.3
11(b) Insured	4,146	1,869	6,015	68.9
SHFA FHA	4,568	2,137	6,705	68.1
SHFA Uninsured	4,472	2,076	6,548	68.3
Substantial Rehabilitation[1]				
HUD FHA, GNMA Tandem	4,332	684	5,016	86.4
SHFA FHA	3,873	2,019	5,892	65.7
SHFA Uninsured	4,437	2,297	6,734	65.9
Public Housing[2]				
Turnkey	5,270	733	6,003	87.8
Conventional	4,555	680	5,235	87.0
236 Rent Supplement	5,385	667	5,940	90.7
Unsubsidized 221(d)4	65	391	456	14.3

* Annual amounts equal the constant annual payment from a 20-year annuity valued at the present value of subsidies and paying an interest rate equal to the discount rate, 11 percent. See Appendix J.

[1]Assumes 167(k) depreciation.

[2]Long-Term financing from the Federal Financing Bank.

Table 7-13

ANNUAL TOTAL PROJECT COSTS, SUBSIDIES AND SUBSIDIES AS A PERCENT OF COSTS. SCENARIO 2. FUTURE.

Program	Annual Development Costs ($)	Annual Operating Costs Excluding Loan Payments ($)	Total Annual Costs* ($)	Total Annual Subsidies ($)	Subsidies as a % of Costs (%)
Section 8					
New Construction					
202	3,724	3,583	7,307	4,469	61.2%
HUD FHA, GNMA Tandem	3,741	3,955	7,696	5,726	74.4
11(b) Insured	3,385	3,864	7,249	6,015	83.0
SHFA FHA	3,759	3,998	7,757	6,705	86.4
SHFA Uninsured	3,613	3,834	7,447	6,548	87.9
Substantial Rehabilitation					
HUD FHA, GNMA Tandem	3,090	3,726	6,816	5,016	73.6
SHFA FHA	3,140	3,777	6,917	5,892	85.2
SHFA Uninsured	3,583	3,824	7,407	6,734	90.9
Public Housing					
Turnkey	4,987	3,803	8,790	6,003	68.3
Conventional	4,270	3,771	8,041	5,235	65.1
236 Rent Supplement	3,632	3,930	7,562	5,940	78.6
Unsubsidized 221(d)4	3,400	3,836	7,236	456	6.3

*This is the annual gross rent that would be needed to cover costs if all projects received a mortgage of 100% of Total Development Costs at the discount rate (11%), and all projects were subject to a 2% property tax rate.

subsidized interest rates than in 1979. The subsidies would increase even more if the financing of Public Housing did not switch to the Federal Financing Bank. This switch saves about $1,000 per year in subsidies. The tandem subsidy increases significantly because of interest rate increases. This assumes that the GNMA mandated maximum mortgage rate of 7.5 percent continues, but we consider a higher rates below.

Finally, indirect subsidies due to the use of tax exempt bonds increase in comparison with 1979. This is due to increases in interest rates which more than offset the decline in the marginal tax rate of bond holders.

7.4 Varying the Assumptions: Sensitivity Analysis

The foregoing analysis is performed using as parameter values actual data for 1979 such as interest rates. In addition, we use values that are generally accepted for the financial analysis of real estate investments such as the marginal tax rates of investors. However, it is unlikely that there is unanimous agreement on what parameter values are most appropriate, and it is of interest to determine the sensitivity of our results to variations in assumptions.

In this section we determine the sensitivity of our results to the assumptions made. Where possible, we choose alternative values of parameters that have some standing in the relevant literature; for example, to determine the forgone taxes due to the use of tax-exempt bonds, we use marginal tax rates suggested by a number of writers in the field.[17] Where relevant literature does not exist, we make assumptions based on relationships in the past and what we think the future has in store. For example, possible future mortgage interest rates under the GNMA Tandem program are based on the relationship between the rate that prevailed since 1975 (7.5 percent) and prevailing conventional mortgage rates and on the conventional mortgage rate we assume for the future (13.5 percent).

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[17]See Section 7.2.5, above.

All of the analysis is done for Scenario 2; an identical standard housing unit is produced under all programs, but the hard costs vary because of differences in "efficiency" and other unobserved program factors. In this way costs and subsidies can vary because of program related factors, but not as a result of the type of housing produced. Also, most analysis is done for the "future".

We start by varying the assumptions that affect the forgone taxes due to the use of tax-exempt bonds. This entails varying the marginal tax rate of investors, but we also determine the effect in the future of assuming that the tax-exempt bond rate is 70 percent of the triple-A bond rate instead of 75 percent.

The effect of raising the mortgage interest rate under the GNMA Tandem program is determined in the next section. This is followed by an analysis of the effects of varying operating costs. One would expect that the cost of operating housing for the elderly is less than that for housing for families. We present the likely magnitudes of these differences and their affects on annual subsidies.

This is followed by an analysis of the effects of alternative holding periods for projects. In particular, we determine the effects of shorter periods between sale and resyndication for buildings held by profit motivated sponsors.

We then analyze the effect of making mortgage loans at the long-term borrowing rate of the Federal Government on the subsidies received by 11(b) and SHFA processed projects. We conclude with an analysis of the effects of alternative assumptions concerning the real economic depreciation experienced by buildings; this affects the foregone taxes due to accelerated depreciation deductions and estimate of capital gain taxes.

7.4.1 The Use of Tax-Exempt Bonds

As we noted in Section 7.2.5 there is no general agreement on the marginal tax rate that should be used to calculate the foregone taxes due to the use of tax-exempt bonds. In our analysis above we use a rate of 38 percent for the "future"; this is the combined effect of a 42 percent federal rate and a 7 percent state tax rate. Two alternative rates that have been proposed are 15 percent by Kormendi and Nagel and 30 percent by those assuming that new tax exempts are purchased by marginal investors who are indifferent between taxable and tax-exempt bonds. Kormendi and Nagel argue that 15 percent is realistic because purchases of tax-exempts are made at the expense of other tax-exempt and highly sheltered investments.

Table 7-14 contains the annual subsidies received by SHFA and 11(b) projects as a result of using 38, 30 and 15 percent tax rates for Scenario 2 in the "future". When the 30 percent rate is used, subsidies decrease by about $300 for 11(b) and SHFA projects. 202 projects still receive the lowest annual subsidies, SHFA uninsured rehabilitation projects the highest, and 11(b)s receive subsidies about as low as HUD processed new construction projects receiving a mortgage under the GNMA Tandem program.

When a 15 percent tax rate is used, the decreases in subsidies are much larger. Total subsidies received by 11(b)s are about $800 less than when a 38 percent tax rate is used, and subsidies received by SHFA projects decrease by about $900. Again, 202s receive the lowest subsidies and uninsured SHFA rehabilitation the highest. The subsidies received by SHFA-FHA rehab and 11(b)s are lower than those received by all programs except 202s. Otherwise, using the lower tax rate tends to eliminate the differences in the subsidies received by these programs, and they receive annual subsidies of about $5,700. Using a lower tax rate decreases the subsidies received by programs using tax-exempt bonds by about one-fifth when a 30 percent rate is used and by about three-fifths when a 15 percent rate is used.

Table 7-14

ANNUAL INDIRECT SUBSIDIES DUE TO USE OF TAX EXEMPT BONDS
AND ANNUAL TOTAL SUBSIDIES UNDER ALTERNATIVE TAX RATES
FOR BOND HOLDERS. SCENARIO 2. FUTURE

Program	Annual Indirect Subsidy Due To Tax-Exempts			Annual Total Net Subsidies		
Tax Rate	0.15	0.30	0.38	0.15	0.30	0.38
New Construction						
11(b)	540	1,079	1,367	5,188	5,727	6,015
SHFA FHA	626	1,251	1,585	5,746	6,371	6,705
SHFA Uninsured	605	1,210	1,533	5,620	6,225	6,548
Substantial Rehabilitation						
SHFA FHA	523	1,045	1,324	5,091	5,613	5,892
SHFA Uninsured	601	1,202	1,523	5,812	6,413	6,734

If for Scenario 2 for the "future" the tax-exempt bond rate is 70 percent of the triple-A corporate rate instead of 75 percent, the bond rate is 8.4 percent instead of 9.0 percent. As a result, annual loan payments and therefore subsidies decrease by about six percent; subsidies are less by from $130 to $170 per year, and this has little effect on the ranking of programs by subsidies received and on subsidies relative to costs.

7.4.2 GNMA Tandem Mortgage Interest Rates

The GNMA Tandem subsidy increases 78 percent from the Scenario 2, 1979 to Scenario 2, Future. This results from the marked increase in the discount at which GNMA sells the mortgages in the secondary market from the 1979 to the future scenarios. The increased discount is due to the increase in the market rate of return from 9.63 to 12 percent, while the mortgage rate under this program is held constant at 7.5 percent. What would be the subsidy in our "future" scenario if GNMA increases the maximum allowable mortgage rate?

To answer this question we calculate the GNMA Tandem and total net subsidies for mortgage interest rates of 9 and 11 percent. From 1975 to 1978 the average conventional mortgage interest rate was about 9 percent, that in 1979 was about 11 percent, and we assume that the conventional mortgage interest rate for the future is 13.5 percent. If GNMA wants a maximum rate relative to the conventional rate like that which prevailed from 1975 to 1978, then it would choose 11 percent; if it wants a rate relative to the conventional rate like that which prevailed in 1979, then it would choose 9 percent.[18]

Raising the maximum mortage rate under the GNMA Tandem program affects total subsidies in two ways. First, the higher mortgage rate increases loan payments, mortgage insurance premiums (MIP) and

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[18]This is derived from: (13.5)(7.5)/(9.0) = 11.25 and (13.5)(7.5)/(11.0) = 9.20.

therefore the rental subsidy needed. Second, the higher mortgage rate decreases the discount at which GNMA sells the mortgage in the secondary mortgage market and therefore the GNMA Tandem subsidy.

The results of varying the mortgage interest rate are presented in Table 7-15. If GNMA sets the maximum rate at 11 percent, the annual average Tandem subsidy is $148, a decrease of $997 from what it would be if the mortgage rate were 7.5 percent. If GNMA sets the maximum mortgage interest rate at 9 percent, the annual Tandem subsidy is $719, a decrease of $426. However, there is no significant effect on total net subsidies.

An examinations of the sum of loan payments, MIP, and Tandem subsidies in Table 7-15 indicates why. Raising the mortgage interest rate causes offsetting changes; increases in loan payments and MIP are approximately equal to decreases in the Tandem subsidy.

7.4.3 Elderly Compared to Family Units, and Other Operating Costs

One topic of interest not covered so far is the difference between the costs and subsidies of housing for families compared to that for the elderly. Some programs make special provisions for the elderly, and others such as 202/8 are designed primarily for them. To compare the two we start with the hard costs from our sample of HUD processed newly constructed units; in this sample we obtain average hard costs for projects for families and for the elderly. From these figures, total development costs and then annual subsidies are calculated.

The comparison is made for Scenario 3 for 1979; there is no attempt to standardize for the type of units developed, and cost variations reflect all three sources of program differences discussed above. To calculate annual subsidies we use annual utility and other operating costs for 236 projects for family housing ($2,748) and these costs for 202 projects for elderly housing

Table 7-15

LOAN PAYMENTS, GNMA TANDEM SUBSIDIES, TOTAL NET SUBSIDIES FOR ALTERNATIVE GNMA MAXIMUM MORTGAGE INTEREST RATES. ($)*

Subsidies and Costs \ Interest Rates	7.5%	9%	11%
Loan Payment and Mortgage Insurance Premium	$2,524	$2,935	$3,505
GNMA Tandem Subsidy	1,145	719	148
Sum of Loan Payment, M.I.P., and GNMA Tandem Subsidy	3,669	3,654	3,653
Total Net Subsidies	$5,726	$5,711	$5,710

* Annualized. See Section J.5 of Appendix J. New Construction, HUD processed GNMA Tandem.

($2,351). As one would expect operation and maintenance is less for the elderly. This is not surprising, because the units are smaller and the tenants easier on the housing.

The total development costs are also higher for family housing, $34,055 compared to $31,831. Again, this should come as no surprise because family units are larger to accomodate larger household sizes. The result is that annual subsidies for family housing are about 16 percent higher than for elderly housing, $4,990 compared to $4,292. At least for these HUD processed units, the differences in operating costs accentuate the differences in development costs.

Although the costs and subsidies are higher for family units, this is not the case when they are stated per household member. The average eldery household has 1.16 members and the average family 2.9 members. This implies that the annual subsidy per member is $3,700 for the elderly and $1,721 for families; the latter receive less than half the subsidy per person as the elderly.[19]

In comparing elderly and family housing we use operating costs that differ and are reasonable estimates of those that prevail for the two types of housing. However, in our previous analysis all programs were assumed to have the same operating costs, those that prevailed for FHA insured units with Section 8. This was necessary because reliable data for operating costs in new construction and rehabilitation for all programs are not available. However, there is some evidence that this biases downward the subsidies received by Public Housing. On the basis of data provided by the Department of Housing and Urban Development, average annual operating costs are 24 percent higher, or $636 per year more, than those used in this

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[19]Household sizes are obtained from U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Participation and Benefits in the Urban Section 8 Program. New Construction and Existing Housing. Volume I, January 1981, p. 76

study. These data are not appropriate for use here, because they represent buildings of all ages and sizes only, whereas our sample includes projects built from 1975 to 1979.

7.4.4 Alternative Project Holding Periods

In the analysis above we analyze projects over a life cycle of 20 years, and we assume that projects are held by one owner over this period. This may be unrealistic. Projects started in the first years of the Section 8 program could be sold after the first five years of operation, and there are incentives to do so. Most of the tax benefits of owning rental housing for low-income households are used up after about seven years. It may then pay an owner to sell to another investor and buy another building to obtain new tax deductions.[20]

To determine the effect of the holding period on the subsidies received, we assume that a project is sold after the first seven years, the second seven years, and the next six years; that is, there are three owners over the first twenty years of project operation. This takes advantage of the optimal seven year holding period, at least for two owners, and maintains a total period of analysis of 20 years. Therefore, our results are comparable to the previous analysis.

The analysis is done for Scenario 2 for the "future". The project is a newly constructed HUD processed unit receiving a GNMA Tandem subsidy, and the development costs are the same as those in our previous analysis of the future for Scenario 2. Also, the interest rates faced by the initial owner and developer are the same as in our previous analysis.

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[20]Brueggeman, et al show that the optimal holding period is seven years for rental housing. See William B. Brueggeman, Jeffrey D. Fisher, and Jerrold J. Stern, "Choosing the Optimal Depreciation Method Under 1981 Tax Legislation." Real Estate Review. Vol. 11, No. 4 (Winter 1982), pp. 32-37.

The calculation of the subsidies received by the initial and two subsequent owners is done assuming that there is no refinancing and the original mortgage is assumed. At each sale the sale price is the current market value and is calculated the same way the sale price is calculated above to obtain capital gains.

The case in which there is no refinancing represents procedures currently being explored by investors and syndicators, and it might be viewed as a transitory strategy until interest rates decrease, the availability of mortgage money increases, and new construction revives. The objective is to realize the tax and syndication benefits of real estate investment and execute sales without obtaining new mortgage loans. In one approach, a buyer gives the seller a small amount of cash, assumes the original mortgage, and gives the seller a note for the difference between the sale price and the sum of the cash payment and the remaining mortgage balance. The interest on the note accrues and all interest and principle are paid when the project is sold again or refinanced.

We assume that the sale is a taxable transaction and capital gains taxes and ordinary income taxes recaptured are paid by the seller upon sale. In the approach described above this requires that the note is negotiable and has a market. If this is not the case, under some circumstaces the payment of capital gains can be deferred until the note is paid.

Our findings are summarized in Table 7-16. When there is no refinancing, rent subsidies and total direct subsidies are the same as when a project is held by one owner for 20 years. All changes occur in indirect subsidies, and there are significant increases due to accelerated depreciation. The new tax law (ERTA, 1981) does not distinguish between new and old buildings, and both can be depreciated over 15 years using the double-declining balance method of depreciation.

The indirect subsidies from expensing construction period interest and taxes also increase. To obtain the deductions taken by the Section 8 project compared to an unsubsidized (d)4, we assume an unsubsidized project is also sold after seven years. Since these projects must amortize construction period interest and taxes over

Table 7-16

ANNUAL SUBSIDIES UNDER ALTERNATIVE PROJECT HOLDING PERIODS. SCENARIO 2. FUTURE. ($)

	Three Owners Over 20 years.* No Refinancing	One Owner Over 20 years
Subsidy		
Rent Subsidy	$3,872	$3,872
Total Direct Subsidies	5,173	5,173
Total Indirect Subsidies	458	553
Total Net Subsidies	$5,634	$5,726

* Assumes project is sold in years 7, 14, and 20 from date of initial operation. New Construction, HUD processed, GNMA Tandem project.

ten years in our future scenario, the deductions in the last three years are lost. Therefore, the difference increases between what owners of the Section 8 project take and what could be taken if the project were an unsubsidized (d)4.

Finally, the capital gains taxes and ordinary income taxes recaptured increase significantly. Surprisingly, the overall effect is a decrease in the total annual net subsidies received when projects are resold and the new purchasers assume the original mortgage. In this case the increased taxes paid upon sale more than offset the increased tax savings due to the liberal accelerated depreciation that can be taken under ERTA.[21]

Under current and proposed regulations, HUD does not increase rental subsidies if financing costs increase on a building under an existing Section 8 contract because of refinacing. Therefore, if the sales of a building are financed by new mortgage loans, rental and total direct subsidies do not change. Only indirect subsidies increase, and the effect on total subsidies is the same as when the original mortgage is assumed.

7.4.5 Effects of Alternatives to Tax-Exempt Financing

Several writers have discussed the inherent inefficiency of tax-exempt bonds. The source of inefficiency is that the tax-exempt interest rate that induces the marginal purchaser to buy a taxexempt bond provides a windfall to inframarginal purchasers. For example, if the volume of tax-exempts is such that taxpayers in the 30 percent marginal tax bracket must be induced to buy, then the tax exempt rate must be 70 percent of the taxable rate. If the latter is ten percent, then the tax-exempt rate must be seven percent, and

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[21]Note that if capital gains and recaptured ordinary income tax payments can be deferred until the subsequent sale of the property (i.e., when the note is paid), then total subsidies increase by about six percent compared to a project held by one owner for 20 years.

investors in the 30 percent tax bracket are indifferent between the two because their after-tax return is the same for both, seven percent. However, investors in the 70 percent tax bracket require only a three percent tax-exempt rate providing an after-tax return of three percent in either investment. If the tax-exempt rate is seven percent, the high income investors received a windfall amounting to four percentage points.

One alternative is to sell taxable bonds and make mortgage loans from the proceeds. Mortgage loans could be made at interest rates lower than the taxable bond rate providing a direct interest subsidy, or mortgage loans could be made at the higher taxable bond interest rate, and direct rent subsidies given to offset this higher rate. The subsidy cost is exactly the same if the appropriate rent subsidy is given. For this reason, the subsidy cost to the government is the same for 202 housing if it continues to give direct interest subsidies, or if it raises the mortgage interest rate and increases the rental subsidy by the amount of the increased loan payment.

However, this is not the case when taxable bonds are substituted for tax-exempts as the source of mortgage funds. There are two changes in the subsidies received. First, if the mortgage interest rate is set equal to the taxable bond rate, then the annual loan payment increases, and larger rent subsidies are required. Second, the indirect subsidy due to the foregone taxes on the interest paid to tax-exempt bond holders is no longer received. The two changes do not necessarily offset each other. The indirect subsidy saved depends on the tax rate of marginal tax-exempt bond holders and what they would purchase is they did not invest in tax-exempts. The increase in the direct subsidy is determined by the difference between the loan payments based on the higher taxable and lower tax-exempt rates.

To determine the effect of substituting taxable for tax-exempt bonds as the source of mortgage money, we calculate the change in annual subsidies received for 11(b) and SHFA projects. This is done for Scenario 2, the "future", using a long-term U.S. bond rate of 11.0 percent.

The changes in the annual subsidies and in the present value of subsidies are presented in Table 7-17. For each program subsidies would decrease; annual subsidies would decrease about $840 for 11(b)s and insured SHFA rehabilitation and over $1,000 for all SHFA new construction and uninsured SHFA rehab. The present value of the savings range from $6,700 to over $9,000.

The savings are substantial and amount to from 20 percent to 30 percent of total development costs. These findings depend on the assumed marginal tax rate of tax-exempt bond holders (38 percent). If 30 percent is used, the annual savings are less; they range from about $550 to $850 and imply savings of from 15 to 25 percent of total development costs.

It appears that changing to the use of taxable bonds could save a lot. Are there costs we have not considered? Hendershott argues that moderate use of mortgage revenue bonds have low efficiency costs, but the increased use of taxable bonds could increase the taxable bond rate thereby increasing Federal financing costs. We cannot evaluate this argument here.[22] In addition, King suggests the use of taxables would require coordination between state and local governments and the Federal Government, and the increased red tape could eat up all of the savings presented above.[23] We cannot reject this argument, but the cost savings in Table 7-15 indicate the magnitude of the additional administrative costs

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[22]See Patrick H. Hendershott, "Mortgage Revenue Bonds: Tax Exemption with a Vengeance." Paper presented to the Mid-Year AREUEA Meetings, Washington, D.C., May 28, 1980.

[23]See A. Thomas King, Op. cit.

Table 7-17

EFFECTS OF LOANS AT U.S. LONG-TERM BOND RATE ON SUBSIDIES RECEIVED. SCENARIO 2. FUTURE.*

Program	Change in Total Annual Subsidies ($)	Change in Present Value of Total Annual Subsidies.**
Section 8		
New Construction		
11(b)	$ -845	$-6,729
SHFA FHA	-1,008	-8,027
SHFA Uninsured	-1,086	-8,648
Substantial Rehabilitation		
SFHA FHA	-841	-6,697
SHFA Uninsured	-1,174	-9,349

* Long-Term U.S. bond rate equals 11.0 percent.

** Discount rate of 11 percent over 20 years.

that are necessary to make the use of taxable bonds inefficient. The conclusion that can be drawn is that the potential for savings exists, and the opportunity in using taxable in place of tax-exempt bonds warrants a more systematic evaluation of the administrative costs involved and an evaluation of the effect on taxable bond rates.

Even if significant savings are possible, using taxable bonds with higher mortgage interest rates would probably be unpopular. The increased rent subsidy that is necessary is a budget item for Section 8 and other housing programs, and the increase in the sale of Treasury bonds is explicitly documented and related to the Federal debt.

In contrast, the use of tax-exempts requires lower rent subsidies, and the effect on Treasury revenues and the Federal debt is indirect. These indirect subsidies, or tax expenditures, are not understood as well as direct line item budget expenditures, and therefore they are less vulnerable to criticism and budget cuts.

7.4.6 Alternative Measures of Economic Depreciation

In most of the foregoing analysis straight-line depreciation over a 40-year building life is used as a measure of economic depreciation. This implies real economic depreciation of 2.5 percent of the original depreciable base each year; that is, real depreciation is constant every year. However, recent evidence suggests that real economic depreciation is approximated better by a geometric rate of 1.5 percent.[24]

The depreciation schedule used affects two components of the subsidies received. As a measure of real depreciation it affects indirect subsidies from excess depreciation deductions. It also affects estimates of a building's value in the future, and therefore affects our estimates of capital gains taxes paid upon sale.

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[24]See Hulten and Wykoff, Op. Cit.

In this section we determine the effect of using the geometric rate on annual subsidies received. This is done in Scenario 2 for the "future" for a HUD processed newly constructed unit receiving a GNMA Tandem subsidy. The effect of using a geometric rate of 1.5 percent is minimal; annual subsidies increase by about $81 or by about 1.4 percent. We expect that this is the order of magnitude of the change for other programs.

7.4.7 The Allocation of Subsidy Costs by Level of Government

There is one last issue to be dealt with before we conclude; what is the incidence of program subsidies on the different levels of government? In most cases this is straightforward. All direct subsidies are borne by the Federal Government. Among the indirect subsidies, the local taxes foregone are borne by county and local governments, those governments which rely most on this source of revenue. The incidence of other indirect taxes is less obvious.,

In our analysis we assume that state governments allow deductions for construction period interest and taxes and for depreciation just like the Federal Government. We also assume that states exempt interest from state and local mortgage revenue bonds from state taxation. Under these assumptions, the overall tax rate combines state and federal rates and assumes state taxes are deductible for the calculation of federal taxes. To illustrate this let t_f equal a building owner's federal marginal income tax rate, t_s equal an owner's state marginal tax rate, and t equal the overall rate. Then

$$t = (1-t_s) \times t_f + t_s.$$

For any income or any tax deduction, the proportion taxed by the Federal Government including the deductability of state taxes is $(1-t_s)t_f$, and the state rate is t_s. Therefore, for indirect subsidies due to excess depreciation, expensing construction period

interest and taxes, and the use of tax-exempt bonds, the proportion borne by the Federal Government is $(1-t_s) \times t_f/t$, and the proportion borne by state governments is t_s/t. For 1979 we assume that $t_f = 0.60$ and $t_s = 0.08$. Therefore, $t = 0.63$, $(1-t_s)t_f = 0.55$, $(1-t_s)t_f/t = 0.87$, $t_s/t = 0.13$, and the Federal Government bears 87 percent and state and local governments bear 13 percent of the subsidies.

7.5 Summary and Conclusions

When programs are analyzed to determine only the effects of financial arrangements on subsidies, unsubsidized (d)4 projects receive no subsidies under the 1979 assumptions. Among low-income housing programs, Section 202/8 projects receive the lowest subsidies followed by Public Housing. These project types have low direct subsidies because gross rents are held down by low property taxes, no payment on equity or mortgage insurance premiums, and low interest rates. They receive low indirect subsidies because they do not take deductions for depreciation and construction period interest and taxes. By contrast, subsidies are highest for state-processed rehabilitation projects when they use the special five-year writeoff for $20,000 of improvement costs (Section 167(k) depreciation).

These findings are almost identical to those of the GAO study where the same programs are analyzed. Both hold hard costs constant and permit only soft costs to vary. Therefore, it is not surprising to find that subsidy costs are lower for programs with low soft costs. However, when we use the actual bricks and mortar costs experienced under each of the program types, many of the findings are reversed. Although Section 202/8 continues to receive the lowest subsidies, and state uninsured rehabilitation the highest, Public Housing now becomes the second most expensive program in terms of subsidy cost. This is due to the marked increase in development costs compared to the scenario in which hard costs are held constant.

When subsidy costs are calculated for the future scenario, using expected interest rates and the 1981 Tax Law, two results emerge. First, there will be little change in development costs when stated in 1980 dollars. However, there will be significant differences in costs to federal, state and local governments in the form of higher direct and indirect subsidies. These result from marked increases in indirect subsidies from depreciation allowances due to tax law changes introduced by ERTA, and higher direct subsidies due to the effect of higher interest rates on rent subsidies, direct interest subsidies, and the tandem subsidy.

In connection with these results, it should be noted that they are extremely sensitive to certain changes in assumptions. For example, the level of indirect subsidies due to the use of tax-exempt bonds is very sensitive to our assumed bond holder tax rate. Using a tax rate of 30 percent instead of 38 percent decreases these subsidies by a fifth, and using a 15 percent tax rate decreases them by three-fifths. This is an area in which researchers disagree and empirical findings conflict.

The level of the Tandem subsidy in the future is also very sensitive to the rate of return expected by purchasers of mortgages from GNMA in the secondary market. However, the Tandem subsidy is insensitive to the maximum mortgage interest rate allowed by GNMA. Increases in this rate produce an increase in the needed rental subsidy; decreases require a larger Tandem subsidy. These are almost perfectly offsetting, and reflect the same principal as our finding that raising the mortgage interest rate for programs receiving direct interest subsidies does not affect the total subsidy needed. Finally, varying the assumed holding period by building owners does not have a significant effect on subsidies received. In fact, if new buyers assume the original mortgage, the subsidies may actually decrease slightly.

Although the estimates of subsidy levels are sensitive to several of the assumptions made, it is important to point out that the relative rankings of the programs by total subsidies are not.

Instead, these rankings are more sensitive to variations in the financial arrangements across programs. It is also essential to recognize that these rankings do not suggest conclusions about the merits of one financing approach as opposed to another. For example, our finding that Section 202/8 consistently receives the lowest subsidies in all scenarios results to a large extent from the non-profit status of Section 202/8 sponsors. However, it may be unreasonable to expect that the non-profit sector will be able to meet a large part of the housing need among low-income people. Similarly, the analysis shows that considerable savings could result from the substitution of taxable bonds for tax-exempts as a source of mortgage financing. Nevertheless, even if such savings persist after administrative costs are taken into account, such a policy could be difficult to implement, particularly since it would entail substituting explicit budget expenditures for current off-budget costs.

Overall, the most significant finding of the analysis is the impact of variations in development costs on subsidy costs to the federal government. Unlike the GAO report (and our Scenario 1), the current study uses actual bricks and mortar costs to calculate program subsidies. The results of this substitution were most dramatic for Public Housing which showed very low subsidy costs when hard costs were held constant among programs but become the second most expensive program type when actual costs were used. Thus, while the financial factors which both studies seek to isolate go a long way in explaining variatons in subsidy costs, these are also strongly influenced by the costs of construction under the various programs. As a result, the current study provides a more complete picture of the costs of supporting various types of multi-family housing.

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GLOSSARY OF DEVELOPMENT COST TERMS

Amount to Make the Project Operational (AMPO): An allowance which can be included in the mortgage insured by HUD/FHA to provide non-profit sponsors with working capital during the initial period of operation of a project. AMPO is ordinarily 2 percent of the maximum insurable mortgage.

Architect's Fees: Professional fees paid to the architect for project design and supervision during construction. For FHA projects these fees are based on a HUD/FHA scale.

Architectural and Engineering Fees: For Public Housing, the costs of all drawings and specifications, surveys, and subsurface investigations required for the project.

Builder's and Sponsor's Profit and Risk Allowance (BSPRA): A credit against the required equity contribution in HUD/FHA insurance programs granted to the developer for services in sponsoring and building the project. For new construction, BSPRA is 10 percent of the approved development costs, exclusive of land costs; for rehabilitation projects, it is 10 percent of development costs, exclusive of the value of the land and structures. BSPRA is used by builders and sponsors with an identity of interest and is in lieu of, not in addition to, builder's profit.

Builder's Profit: An amount paid as the builder's profit for FHA-insured construction, in cases where there is no identity of interest between the builder and the sponsor.

Construction Costs: Under the FHA system, the amount due under the terms of the lump sum or cost-plus construction contract, exclusive of builder's profit. Includes the costs of site improvements as well as the costs of constructing and equiping all structures.

Construction Period Carrying Charges: Includes interest on the construction loan, taxes, and property insurance paid by FHA developers for the period from initial endorsement through construction.

Consultant's Fees: Fees paid by non-profit sponsors to a HUD-approved housing consultant for services related to FHA project development. The maximum fee allowable from Section 202 loan proceeds is $27,500.

Contingency Fund: For FHA-insured rehabilitation projects only, the contingency fund is used to cover change orders during construction. The amount of the fund is based on the experience of the contractor.

Contingency Reserve: In Public Housing development, a reserve to cover construction change orders. The reserve is equal to 2 percent of the estimated project cost.

Dwelling Construction: Under the Public Housing system, the costs of normal excavation and backfill, foundations and dwelling structures, where the latter includes all required common spaces, plumbing, heating and air conditioning, electrical, and elevators.

Dwelling Equipment: For Public Housing, the costs of ranges, refrigerators, shades, screens, and other similar equipment.

FHA Examination Fee: A fee equal to .3 percent of the mortgage amount to cover the costs of FHA insurance processing.

FHA Inspection Fee: This fee is .5 percent of the mortgage amount and reimburses HUD for the cost of inspections during construction.

Financing Fee: An initial service charge paid by the developer to the construction lender. The fee is limited by HUD/FHA to 2 percent of the mortgage amount.

FNMA/GNMA Fee: This fee, 1.5 percent of the mortage amount, is paid by the developer for the promise of FNMA/GNMA to purchase the project mortgage.

Hard Development Costs: Combined expenditures on improvements, land, and off-site costs.

Land: For FHA projects, land represents the appraised value of the land, or the land and shell in the case of rehabilitation projects. This value may or may not correspond to the actual purchase price.

Legal Organizational and Audit: Under FHA, expenses incurred in organizing the mortgagor entity; developing the project proposal for submission to HUD; services during the initial closing, final closing, and construction period; and audit expenses for cost certification.

Liquidated Damages: A penalty for the contractor's failure to complete the project on time. This includes reasonable charges for loss of rentals, administrative costs, carrying charges or other expenses related to delay in delivery.

Mortgage Insurance Premium (MIP): An annual premium equal to .5 percent of the mortgage amount in consideration of HUD/FHA's contract to insure the project.

Non-Dwelling Construction: For Public Housing, any construction applicable to administrative, maintenance and community structures or spaces.

Non-Dwelling Equipment: Equipment applicable to administrative, maintenance, or community spaces.

Off-Site Costs: Costs of required infrastructure improvements beyond the boundaries of the property.

Planning Costs: In Public Housing, charges for consultants, permits, inspection costs, surveys, and other planning associated with project development.

Relocation: Costs associated with the relocation of residents displaced by Public Housing development.

Site Acquisition Costs: For Public Housing, the expenses of acquiring the site, including property purchases, condemnation, excess property, and survey and maps.

Site Improvements: Costs of improvements to the site outside the building walls, such as grading, utilities, streets and walks, parking, landscaping, and other improvements related to the subsoil or site topography.

Soft Development Costs: Combined expenditures on construction period carrying charges, programmatic processing, and financing fees, legal and organizational costs, developers and/or builder's fee, and, for Public Housing, agency planning and administrative costs.

Supplemental Management Fund: An amount equal to $100 per FHA-insured dwelling unit to cover: (1) review and development of the management plan by the managing agent prior to conditional commitment and the screening of tenants, and (2) where applicable their qualification for benefits, from the period beginning 90 days before initial occupancy through sustained occupancy. This amount is excluded from the calculation of the Builder's and Sponsor's Profit and Risk Allowance.

Title and Recording Fees: Costs typically incurred by the mortgagor in connection with the mortgage transaction: recording fee, mortgage and stamp taxes, cost of survey, and title insurance.

Total Interest: In Public Housing, the costs of interest payed to HUD, interest on non-HUD notes, and interest on bonds, minus any interest earned from investments.

Turnkey Developer's Other Costs: Line item in Public Housing cost reporting which may include the itemized costs of: interim financing; applicable closing costs; developer fee and overhead; sales, excise, or other state or local taxes; and property taxes or assessments.

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