PUBLIC ENTERPRISE EVALUATION: A CASE STUDY

OF THE NATIONAL HOUSING CORPORATION, KENYA

by

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Summary: PhD Dissertation

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Public Enterprise Evaluation: A Case Study
of the National Housing Corporation, Kenya

The study aims to evaluate Kenya's National Housing Corporation (NHC), the public enterprise responsible for implementing the government's housing policy. The primary objective of the NHC is to finance and develop housing that is affordable by lower-income groups. An assessment is made of the extent to which this organization meets both the immediate housing objectives set for it and the more general objectives of economic efficiency and equity. On the one hand, a comparative evaluation is conducted, with a view to assessing the NHC's productive efficiency relative to private developers. On the other hand, a direct evaluation is carried out in order to establish the Corporation's effectiveness in meeting its specified objectives. More specifically, effectiveness is measured mainly in terms of the number of dwellings produced relative to development plan targets; dwelling costs relative to household earnings, and the ability of the NHC financially to break even subject to transferring subsidies to beneficiaries.

An eclectic analytic framework is employed informed by the traditional economic theory of the firm, and by managerial and behavioural models. Prominent in this regard are the principal-agent and property rights theories. A number of hypotheses are tested. The first, based on the principal-agent model, is that the NHC's actual goals will diverge from the formal goals set for it. The second hypothesis is that the Corporation management exercises managerial discretion via expense preference. The third is that arising from the greater attenuation of property rights in public enterprises, the NHC is less productively efficient than private developers. Fourth, it is hypothesized that the housing prices and rents charged by the Corporation are allocatively inefficient. The final hypothesis is that there is neither vertical nor horizontal equity in the subsidies that underlie NHC financed housing.

Taken together, our findings suggest that the Corporation is a viable organization that meets its main objectives. However, its actual housing programme has shifted away from lower-income housing and overall dwelling output has been lower than planned. With regard to productive efficiency, there seems to be no systematic evidence that the NHC is less cost efficient than private developers. Even so, some cases of substantial productive inefficiency are identified. An investigation of allocative efficiency shows that the rate of return on NHC dwellings is significantly lower than a benchmark return set by the Treasury, suggesting that unless the implied subsidies could be justified socially, NHC prices and rents are allocatively inefficient. Finally, an enquiry into equity indicates that the distribution of subsidies is regressive at higher income levels and that such subsidies are not tenure-neutral.

DECLARATION

I hereby declare that this dissertation entitled **PUBLIC ENTERPRISE EVALUATION: A CASE STUDY OF THE NATIONAL HOUSING CORPORATION, KENYA** is the result of my own work and includes nothing which is the outcome of work done in collaboration.

It is not substantially the same as any that I have submitted for a degree or diploma or other qualification at any other university.

I further state that no part of my dissertation has already been or is being concurrently submitted for any such degree, diploma or other qualification.

The dissertation does not exceed the regulation length including footnotes, appendices and bibliography.

Date................... Signed......................

ACKNOWLEDGEMENTS

DEDICATION

To Joan, Wambui and Njeri

For their Love and Encouragement

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ABBREVIATIONS

CBS   Central Bureau of Statistics
CoL   Commissioner of Lands
HFCK   Housing Finance Company of Kenya
HGP   Housing Guaranty Program
HRDU   Housing Research and Development Unit
JCC   Joint Consultative Committee
KSh   Kenyan Shilling
MHSS   Ministry of Housing and Social Services
MMC   Mombasa Municipal Council
NBK   National Bank of Kenya
NCC   Nairobi City Commission
NHC   National Housing Corporation
LDCs   Less Developed Countries
RoK   Republic of Kenya
SOE   State Owned Enterprise
USAID   United States Agency for International Development

CURRENCIES

1 Kenyan Pound = 20 Kenyan Shillings
1 United States Dollar = 28 Kenyan Shillings (1990)

SUMMARY

The study aims to evaluate Kenya's National Housing Corporation (NHC), the public enterprise responsible for implementing the government's housing policy. The primary objective of the NHC is to finance and develop housing that is affordable by lower-income groups. An assessment is made of the extent to which this organization meets both the immediate housing objectives set for it and the more general objectives of economic efficiency and equity. On the one hand, a comparative evaluation is conducted, with a view to assessing the NHC's productive efficiency relative to private developers. On the other hand, a direct evaluation is carried out in order to establish the Corporation's effectiveness in meeting its specified objectives. More specifically, effectiveness is measured mainly in terms of the number of dwellings produced relative to development plan targets; dwelling costs relative to household earnings, and the ability of the NHC financially to break even subject to transferring subsidies to beneficiaries.

An eclectic analytic framework is employed informed by the traditional economic theory of the firm, and by managerial and behavioural models. Prominent in this regard are the principal-agent and property rights theories. A number of hypotheses are tested. The first, based on the principal-agent model, is that the NHC's actual goals will diverge from the formal goals set for it. The second hypothesis is that the Corporation management exercises managerial discretion via expense preference. The third is that arising from the greater attenuation of property rights in public enterprises, the NHC is less productively efficient than private developers. Fourth, it is hypothesized that the housing prices and rents charged by the Corporation are allocatively inefficient. The final hypothesis is that there is neither vertical nor horizontal equity in the subsidies that underlie NHC financed housing.

Taken together, our findings suggest that the Corporation is a viable organization that meets its main objectives. However, its actual housing programme has shifted away from lower-income housing and overall dwelling output has been lower than planned. With regard to productive efficiency, there seems to be no systematic evidence that the NHC is less cost-efficient than private developers. Even so, some cases of substantial productive inefficiency are identified. An investigation of allocative efficiency shows that the rate of return on NHC dwellings is significantly lower than a benchmark return set by the Treasury, suggesting that unless the implied subsidies could be justified socially, NHC prices and rents are allocatively inefficient. Finally, an enquiry into equity indicates that the distribution of subsidies is regressive at higher income levels and that such subsidies are not tenure-neutral.

1. INTRODUCTION

1.1 Introduction

Public enterprises[1] are an important form of economic organization. In the less developed countries (LDCs), such enterprises are found in a wide range of economic activity and their overall contribution to national investment is substantial. The sectors in which their role is prominent are construction, transport and communications, and electricity. Statistics quoted by Adhikari and Kirkpatrick (1990) show that in 1984, the share of public enterprises in total investment was over 28 percent in LDCs, as compared to about 10 percent in industrial countries for the period 1975-79. In Kenya, this share was nearly 20 percent.

This study aims to evaluate a public enterprise, Kenya's National Housing Corporation (NHC), in order to establish the extent to which it meets both the immediate objectives set for it and the more general objectives of economic efficiency and equity.

Housing in Kenya, as is the case in many other countries, is produced by public and private firms alike. The NHC is the principal public organization that is responsible for financing and developing housing, especially that meant for lower-income households. Private developers, too, produce a substantial number of similar dwellings for those who can afford the market prices and rents charged. These dwellings therefore provide a good basis for assessing, in comparative terms, the NHC's immediate objective of providing lower-income housing. In addition, the NHC will be compared with other generally similar financial institutions. Besides this comparative approach, the Corporation will be evaluated directly in order to determine the success with which it meets its own objectives and those set out by the government in various national development plans.

Such a study is considered important for a number of reasons. First, the NHC is the main public institution entrusted with providing lower-income housing. This role has indeed made the Corporation the largest financier and developer of housing in Kenya. Second, no previous work has examined the behaviour of the NHC within the context of an analytic framework informed by theories of the firm. In particular, this is the first investigation into the implications for NHC behaviour of the principal-agent and property rights models. Third, the performance of public enterprises in the country is currently being questioned and a study of this type can contribute to the ongoing debate on such enterprises. Finally, several other African states own similar corporations, which suggests that the findings could be generalised beyond the context of the

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[1]   Rees (1984, p. 1) defines a public enterprise as "an organization which produces and sells goods or services, and whose assets are are owned, not by private shareholders, but by a public agency". It is presumed, he adds, that such an enterprise serves the interests of the public and should not aim solely to maximize profit.

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study.

1.2 The Research Problem

The principal research question is how to evaluate the effectiveness of the NHC in meeting its immediate and wider social objectives. In order to deal with this central question, it is necessary to address three other issues, which therefore become part of a broader enquiry. First, where objectives are not clearly stated, their identification forms part of the investigation to be conducted.[2] Second, as we see later, the focus of existing theories of the firm is not the public enterprise, which typically operates within an administrative monitoring and control framework and has social objectives to meet. The concern of such theories is the private business firm. At the one extreme is traditional microeconomic theory which deals with abstract, profit maximising firms in a market system. At the other extreme are managerial and behavioural theories which, to different degrees, take into account the importance of internal organization, property rights and transaction costs. Part of the problem, therefore, is to determine the extent to which these theories are suited to a study of public enterprises and what analytic framework should be adopted to that end. Third, it is necessary to develop an evaluation procedure that allows predictions of theory to be tested. In this regard, a number of behavioural propositions will be tested, using as case studies, various projects financed by the NHC.

The NHC's primary objective is to finance and develop housing affordable by lower-income groups. In the wider context, the Corporation is also expected to provide such housing in a socially efficient and equitable manner. Therefore, in selecting the NHC as the main form of economic organization via which to attain its housing goals, the government could be assumed to have had a range of expectations. The first is that the Corporation would be effective in terms of producing the dwellings projected in various development plans. The second is that the NHC would be economically efficient, applying scarce resources to the best advantage. The third, is that, unlike private firms, the Corporation would concern itself more directly with ensuring equitable access to its housing.

To determine the Corporation's effectiveness in goal achievement it will be necessary to investigate such aspects as housing production relative to targets in development plans; dwelling costs relative to earnings; the ability to break even subject to transferring to beneficiaries the subsidies implicit in government loans and land, and the ability to meet project budgets in terms of time and cost.

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[2] An example of this, which is discussed in Chapter 8, is the NHC's social objective of transferring subsidies to beneficiaries subject to achieving breakeven on the basis of historic costs.

In regard to economic efficiency, two aspects need to be examined. These are productive efficiency, which requires the use of the best techniques and least cost production, and allocative efficiency which has to do with the extent to which prices reflect the long-run marginal cost of production. Accordingly, the research question to be addressed here is the degree to which, in its housing production, the NHC meets these two conditions for economic efficiency.

Equity in housing provision may be seen to revolve around two considerations. The first is vertical equity which suggests the progressive distribution of housing subsidies within each tenure (Lansley, 1979; Kay and King, 1986). The second is horizontal equity which is satisfied where households with comparable incomes, within and between tenures, are treated equally. The issue, therefore, is to establish whether or not programmes financed by the NHC satisfy these equity criteria.

1.3 Analytic Framework

To study the behaviour of a particular firm, such as the NHC, we cannot rely solely on the traditional or marginalist theory of the firm. This is because in conventional microeconomics, the theory of the firm is concerned primarily with the behaviour of profit maximising firms in a market system and not with the operations of an actual firm (Machlup, 1967). In large measure, therefore, our analytic framework is eclectic, combining a number of approaches. First, we need to employ the traditional theory because its predictive power makes it well-suited to determining how firms might respond to changes in their economic environment. Further, the theory sets out the necessary conditions for productive and allocative efficiency, aspects that are important to this study. To retain its predictive power, however, the theory is of necessity abstract and it does not therefore look at the ownership, internal organization, and control of firms (Gravelle and Rees, 1981). For this reason, a second approach looks at managerial and behavioural theories of the firm. Unlike the traditional theory, managerial theories assume maximands other than profit maximization. The main models are by Baumol (1959) who proposes that firms maximize sales revenue, Marris (1964) whose maximand is the rate of firm growth, and Williamson (1964) whose hypothesis is that managers maximize a utility function comprising salaries and perquisites. Behavioural theories, whose principal proponents are Simon (1959) and Cyert and March (1963), are essentially non-predictive, unless additional assumptions are made. Simon emphasized non-maximising behaviour, arguing that firms aim at achieving satisfactory results. In other words, they "satisfice". Cyert and March focused on conflict among different coalitions within the firm with the result that goals are determined by the dominant coalition.

These early managerial and behavioural theories have not been fully incorporated into the economic mainstream and have to a significant degree been replaced by newer managerial

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theories which highlight the contractual nature of the firm and the role of information and uncertainty (Furubotn and Pejovich, 1972; Jensen and Meckling, 1976; Hart, 1989). Aspects of these newer theories that are particularly relevant to this study are those that focus on the principal-agent relationship, and the concept of property rights. The principal-agent model makes three key assumptions. The first is that the interests of the principal (say, the owners of a firm) and those of the agent (the manager) diverge. The second is that both parties operate in an uncertain environment. The third is that the principal does not have complete information on the behaviour of the agent. As a result, the principal's problem is to design a contract that ensures that the actions of the agent are consistent with the objectives of the principal (Strong and Waterson, 1987).

Property rights refer to the access of each individual to the use of resources (Furubotn and Pejovich, 1972). Using this approach, it is then hypothesized that the greater attenuation of property rights in public enterprises results in behaviour that is different from, and less efficient than, that of private firms. In particular, monitoring costs in publicly owned firms are considered to be higher.

1.4 Main Hypotheses

A number of hypotheses will be tested. The first, based on the principal-agent model, is that the NHC's actual goals will diverge from the formal goals set for it. The supposition here is that the government's monitoring and control framework allows considerable freedom of decision, giving rise to a significant agency problem between the government and the NHC. The second hypothesis, following Williamson (1964), is that the NHC management exercises managerial discretion via expense preference. To put it another way, it is supposed that the Corporation management maximises a utility function comprising salaries, allowances and various other perquisites that give utility. The third hypothesis is that arising from the greater attenuation of property rights in public enterprises, the NHC is less productively efficient than private developers. Fourth, we are going to test the hypothesis that NHC rents and prices diverge from the long-run marginal cost of housing provision and are therefore allocatively inefficient, taking account of subsidy. Our final hypothesis will be that there is neither vertical equity nor horizontal equity in the subsidies that underlie NHC financed housing. A procedure to test these broad hypotheses will be developed. As a complementary measure, where necessary, more specific hypotheses will be investigated.

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1.5 Organization of the Study

Following this introduction, Chapter 2 describes the NHC. It provides basic information relating to the immediate and wider objectives of the Corporation, its programmes and how these are financed, and also looks at government's monitoring and control regime. Chapter 3 concerns itself with an analytic framework for the study. Besides reviewing the related literature, the chapter examines the traditional theory of the firm, the early managerial and behavioural models, and the more recent managerial theories, especially the principal-agent and property rights models. In the context of these theories the comparative behaviour of private firms and public enterprises is examined. Finally, the chapter discusses aspects relating to the direct evaluation of publicly owned firms. The research method, which is set out in Chapter 4, looks at how the NHC will be assessed, both directly and on a comparative basis. We first explore how the Corporation's productive efficiency relative to private developers will be investigated, before setting out our approach to the questions of allocative efficiency, equity, and the performance of the Corporation relative to its objectives. Finally, the chapter describes the data required for the study and how these were collected and analysed. Attention is paid to shortcomings in the data and the resulting implications for the study. The empirical findings of the study are contained in Chapters 5 to 8. Chapter 5 investigates the relative productive efficiency of the NHC. To examine whether or not the Corporation is as productively efficient as private developers, production costs of NHC and private projects are compared. Allocative efficiency is the subject of Chapter 6. There, the main question is to establish the extent to which prices and rents of housing financed by the NHC deviate from the long-run marginal cost of housing provision, and whether or not such deviation implies allocative inefficiency, taking account of subsidy. This approach is complemented by an evaluation of the rates of return on NHC housing. In order to conduct an empirical enquiry, we employ two case studies. The first comprises three relatively large projects developed recently in Nairobi by the NHC. The second consists of rental housing managed directly by the Corporation.

In Chapter 7 we explore the vertical and horizontal equity of the subsidies that underlie NHC financed housing, using the rental housing stock of the Nairobi City Commission[3] as a case study. This housing has been financed almost entirely by the NHC and, following a justification of its selection as a case study, we turn to the distribution of subsidies to tenants, making comparisons with subsidies to owner-occupiers. Aspects of access to subsidies are also outlined, taking into account that private tenants pay market rents. In Chapter 8 we conduct a form of performance evaluation of the Corporation, assessing its overall effectiveness in meeting specified objectives. These objectives have to do mainly with the number of dwellings produced and their costs, relative to development plan targets; and the degree to which the NHC is able to transfer subsidies to beneficiaries subject to achieving breakeven in terms of historic costs. Finally,

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[3]   This is the local authority that has jurisdiction over Nairobi.

Chapter 9 draws together the main conclusions, evaluates their worth and looks at their implications for policy. Related areas that require further research are also identified.

2. NATIONAL HOUSING CORPORATION

2.1 Introduction

The NHC may be said to have begun operations in 1953 as the Central Housing Board. During the 1950's and early 1960's the Board proved ineffective, judged in terms of its housing output, and therefore ill-equipped to cope with the housing needs of a rapidly expanding urban population (Stren, 1978). This population growth had been brought about by the lifting of regulations that had hitherto restricted the migration of Africans into urban areas. In 1967, following a recommendation by the United Nations (Bloomberg et al., 1965), the Housing Act[1] was amended converting the Board into a public corporation.

The purpose of this chapter is to describe the NHC with a view to understanding its objectives and operations, as well as bringing out the attributes of the institutional and market environment within which it operates. Such an exercise may also suggest the direction that our theoretical analysis should take. We start with a statement of the immediate and wider social objectives that the government has set for the NHC. We then examine the Corporation's housing programmes, past and present, giving attention to how these programmes have changed over time. Next, the Corporation's access to government finance and land is examined followed by a description of its role as developer and financier. Finally, we look at the government's framework of control for the NHC.

2.2 The NHC's Objectives

2.2.1 Immediate Objectives

The NHC has both immediate and wider social objectives. Its immediate objectives, as set out in the Housing Act are to:

(a) Lend or grant money to any local authority, for the purpose of enabling the authority to exercise any of the powers conferred upon it by the Act;

(b) Make loans to any company, society or individual person for the purpose of enabling such company, society or individual person to acquire land and construct thereon approved dwellings or to carry out approved schemes;

(c) Construct dwellings, carry out approved schemes and lay out and provide services for approved schemes;

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[1]   Laws of Kenya, Chapter 117, 1972 (1953).

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(d)   Make loans to organizations established for promoting the development of housing.

These objectives are repeated in one form or another in various national development plans (RoK, 1974, 1979a, 1983). In addition, these plans set targets for the NHC in terms of the number of dwellings to be financed and their cost levels. Estimates of the financial resources required to meet these targets are also stated.

2.2.2 *Social Objectives*

Besides its immediate objectives, the NHC has a number of social objectives. First, government policy, as stated in the various development plans, requires the Corporation to ensure that the housing it produces is affordable by lower-income groups[2] and that its allocation is equitable. Affordability is influenced by many factors, the more important of which are household income, level of subsidy, design standards, and the cost efficiency of projects. Lower costs also allow more dwellings to be built for a given outlay, an important consideration given that there is a numerical shortage of suitable dwellings in Kenyan towns (RoK, 1986b). Consequently, the overriding aim of the NHC is to produce basic, but functional dwellings that lower-income groups can afford.

Second, in support of the country's local government system, the NHC makes housing loans mainly to local authorities, and not to private firms. Indeed, while the Housing Act permits loans to private firms the Corporation has, with little exception, not made such loans (Personal Discussion with NHC officials, 1989). Third, the NHC supports small domestic contractors by giving them preference in the award of construction contracts. This practice is consistent with the government's policy of supporting such contractors (Wells, 1986).

2.3 NHC's Housing Programme

In this section we describe the NHC's housing programme, starting with its past projects before turning to those currently under implementation. Our concern is to show how the programme has changed over time in terms of size, as well as in terms of its structure.

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[2]   There appears to be no consistent definition of lower-income groups in Kenya. One common definition refers to households between the second and fifth deciles on the income distribution (see World Bank, 1983). This is the definition used here. The traditional assumption is that households below the second decile cannot afford housing programmes sponsored by the formal sector.

2.3.1 Past Programmes

In working towards the accomplishment of its objectives the NHC has become the largest developer and financier of housing in Kenya. Between 1965 and 1989 it developed, either directly, or indirectly through local authorities, over 42,000 housing units. This total was comprised of rental dwellings (28.5 percent), dwellings for sale on tenant-purchase[3] terms (19.7 percent), site and service[4] units (46.6 percent), and housing for sale on mortgage[5] terms (5.2 percent). The value of this programme was Kenyan £ 67.4 million,[6] distributed as follows: rental dwellings, 25.7 percent; dwellings for sale on tenant-purchase terms, 17.4 percent; site and service units, 30.2 percent, and housing for sale on mortgage terms, 26.7 percent. Information on the Corporation's output is shown in greater detail in Table 2.1.

The table reveals interesting changes in the NHC's housing programme. Over the 10-year period, 1965-1974, rental housing was the dominant tenure, accounting for about 44 percent of all housing units produced and for 50 percent of total value. Site and service units made up 20 percent of the total number of units, but only just over 3 percent of total expenditure. Conversely, dwellings for sale on mortgage terms accounted for under 6 percent of the total number of units, but as much as 22 percent of total value.

In the decade that followed, 1975-1984, there were substantial changes in the housing programme, not only in terms of total output but also in terms of its composition. The total number of units rose from just under 18 thousand to over 22 thousand and total value from about Kenyan £ 17 million to over Kenyan £ 40 million. The changes in tenure categories were more dramatic. The proportion of rental dwellings declined from the 44 percent of a decade earlier to just below 18 percent. The corresponding fall in relative value was from about 50 percent to 19 percent. Conversely, the proportion of site and service units rose from 20 percent to over 68 percent with the corresponding value rising from just over 3 percent to nearly 46 percent. Changes in tenant-purchase housing were equally dramatic with the number of dwellings declining threefold from the 30 percent of a decade earlier. Consequently, the relative value of this category fell from about 24 percent to 14 percent. The only category that did not show marked change was that comprised of dwellings for sale on mortgage terms. The proportion of

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3   In tenant-purchase housing, the title is conveyed to the buyer only after he repays the loan made to him. Ownership finance is provided by the NHC on subsidised terms.

4   Site and service projects consist of residential plots provided with basic infrastructure services such as roads, and water and sewerage reticulation. The plots are usually allocated to lower-income households.

5   Dwellings sold on mortgage terms differ from tenant-purchase dwellings in two respects. First, ownership finance is made on commercial terms by financial institutions other than the NHC. Second, titles are conveyed to buyers upon the conclusion of sale contracts. The term "mortgage" project, which appears in this study, is in common use in Kenya and refers to projects consisting of dwellings sold via mortgage loans.

6   For ease of comparison with figures in the Corporation's annual reports, the source of the data given here, this amount has not been adjusted to reflect constant pounds.

dwellings in this category declined from about 6 percent to just under 4 percent, whilst relative expenditure remained stationary at about 20 percent.

Table 2.1 Housing Output, 1965-1989

A. Output in number of units

	1965-74	%	1975-84	%	1985-89*	%	Total	%
Rental	7874	44.1	3984	17.6	202	10.6	12060	28.5
TP**	5399	30.2	2334	10.3	594	31.2	8327	19.7
S & S***	3571	20.0	15457	68.5	745	39.0	19773	46.6
"Mortgage"	1009	5.7	809	3.6	365	19.2	2183	5.2
Total	17853	100.0	22584	100.0	1906	100.0	42343	100.0

B. Project Value. Kenyan £ '000

	1965-74	%	1975-84	%	1985-89*	%	Total	%
Rental	8492	50.9	7808	19.2	1029	10.2	17329	25.7
(Average	1.08		1.96		5.09		1.44)	
TP**	3943	23.6	5669	14.0	2100	20.8	11712	17.4
(Average	0.73		2.43		3.54		1.41)	
S & S***	576	3.4	18521	45.6	1285	12.7	20382	30.2
(Average	0.16		1.20		1.73		1.03)	
"Mortgage"	3690	22.1	8620	21.2	5671	56.3	17981	26.7
(Average	3.66		10.66		15.54		8.24)	
Total	16701	100.0	40618	100.0	10085	100.0	67404	100.0

Sources: NHC 1986/87 Annual Report; NHC records, for the period
         July 1987 to June 1989.
* To June 1989   ** Tenant-Purchase   *** Site and Service
Note: 1. Percentages are based on column totals.
      2. Money values have not been adjusted to reflect constant
         pounds in order to allow direct comparison with figures in
         NHC annual reports.
      3. Project value does not include expenditure on projects
         under construction.

The final five years covered by the table again show a substantially changed programme. First, the size of the programme declined significantly. While the annual value of completed projects averaged Kenyan £ 4 million a decade earlier, it was down to Kenyan £ 2 million per year between 1985 and 1989, a considerable decline given that these figures do not take inflation into account. Correspondingly, the number of units produced per year dropped from about 2,260 dwellings to about 380. Second, dwellings for sale on mortgage terms made up over 56 percent of total value up from about 20 percent during each of the previous two decades. Third, the output of rental housing continued to decline both in terms of numbers and value.

During each of the three periods considered, site and service projects had the lowest value per unit and dwellings for sale on mortgage terms the highest. The other two categories consisted of dwellings of comparable value per unit. Overall, the dominant trend was a shift from lower-income housing to higher-income housing. This trend has been reinforced in the current programme, as we show in the next section.

2.3.2 Current Programme

The NHC's current housing programme consists of nearly 5000 units. Here, we have defined the current programme to comprise projects completed in 1990, and those presently under construction, at the tender stage or at an advanced stage of design. Table 2.2 provides details on this programme. In the table, we have distinguished two types of tenant-purchase projects reflecting differences in cost levels. Type 1 is made up of lower-cost dwellings financed under the Housing Guaranty Program (HGP) of the United States Agency for International Development. This programme is described later in this chapter. Type 2 projects, which fall outside the HGP, consist of higher-cost dwellings financed by means of ordinary Treasury loans.

The table shows that the Corporation's programme is dominated by tenant purchase projects (Type 2), and projects containing dwellings for sale on mortgage terms. Taken together, these two categories make up about 68 percent of all units and nearly 90 percent of the estimated total cost. Dwellings in the two categories, as well as rental units, are of relatively high unit costs. The other categories, consisting of tenant-purchase (Type 1) and site and service projects, account for 12 percent of all units and for only 6 percent of estimated total cost. An assessment of the NHC's actual programme relative to targets in various national development plans will be undertaken in the chapter on performance evaluation (Chapter 8).

Table 2.2 NHC: Current Housing Programme

Project Type	No. of Units	%	Estimated Cost Kenyan £ '000	%	Average Cost Kenyan £
Rental	245	5.0	3485	5.5	14225
Tenant Purchase (Type 1)	969	19.9	3196	5.1	3300
Tenant Purchase (Type 2)*	2214	45.3	29507	46.7	13330
Site and Service	357	7.3	558	0.9	1565
"Mortgage"	1099	22.5	26360	41.8	23985
Total	4884	100.0	63106	100.0	12920

Source: NHC Schemes Progress Report, December, 1990.
* Comprises projects in Nairobi (Kibera Phases 1 and 2; Pumwani)
  and 1 project in Kisumu. These projects fall outside the HGP.

2.4 Access to Government Finance and Land

2.4.1 Finance

The NHC depends almost wholly on the exchequer for loans to finance its projects. It can also borrow from other sources subject to government approval. Government loans to the NHC are for 40 years at a fixed annual interest rate of 6 percent. Since long-term housing loans in the private market are now made for 15 to 20 years at an interest rate of about 19 percent per year, it will be seen that government lending to the NHC is highly subsidised. Although official policy has recently advocated the adoption of market interest rates (ROK, 1986a), this policy has not yet been reflected in government loans to the NHC, nor in NHC loans to local authorities and individuals.

Further, the Treasury on occasion borrows from financial institutions in the United States of America (USA) under the USAID Housing Guaranty Program (HGP) mentioned earlier. These loans are in turn made to the NHC for 30 years at an interest rate equivalent to that applicable to

treasury bonds in the USA. Another source is the World Bank whose loans are onlent to the NHC for periods of up to 30 years. On the whole, interest rates on foreign loans are less than 13 percent and are therefore lower than the current market rate. The government protects the NHC from the risk of borrowing by lending at fixed interest rates and also by assuming the currency exchange risk of foreign loans. Ordinary Treasury loans have usually made up about a half of total loans to the NHC, with the remainder shared almost equally between HGP and World Bank loans. In the current programme, however, projects financed by donor agencies account for only 5 percent of total planned expenditure. They comprise the tenant-purchase (Type 1) category shown in Table 2.2.

In Table 2.3 we have given a summary of the various loan sources and the Corporation's borrowing and lending terms.

Table 2.3 NHC: Sources of Loans and Loan Terms

	NHC Borrowing terms	Lending Terms to Local Authorities
Ordinary Treasury Loans	- 6 % interest p.a.; 40 year repayment period	- 6.5 % p.a. 40 year repayment period for rental housing; 20-25 year period for tenant-purchase housing
USAID Housing Guaranty Program Loans	- Variable interest: usually 10-13 % interest p.a. - 30 year repayment period	- Interest rate is equal to borrowing rate plus 0.5 % - 20-25 year repayment period
World Bank loans*	- Usually 10-13 % interest p.a.; - 30 year repayment period	ditto

p.a = per annum
* The government's borrowing terms are different. Borrowing terms are those that apply to the NHC

It will be seen from the table that the terms and conditions of NHC's loans to local authorities, where ordinary Treasury loans are concerned, depend on the tenure of the housing in question. For rental housing, the NHC lends for 40 years at an annual interest rate of 6.5 percent,

that is, 0.5 percent higher than its borrowing rate. This margin is meant to cover loan administration costs. For tenant-purchase housing loans are made for 20 to 25 years, again at an annual interest rate of 6.5 percent.[7] World Bank and HGP loans, which in all cases are meant for housing sold on tenant-purchase terms, are made to local authorities at an annual rate of interest of 9.5 to 13.5 percent for 20 to 25 years.

2.4.2 Repayment of Government Loans

Government loans to the NHC are repayable in equal, semi-annual instalments. However, the NHC has traditionally faced little pressure to repay promptly and as a result, its loan account with the government is in substantial arrears. By 1989, the outstanding loan charges had increased to over Kenyan £ 25 million. Several reports of the Auditor-General (Corporations)[8] have drawn attention to these arrears, but no remedial measures appear to have been taken. For instance, in his 1989 report on the 1987 accounts of the NHC the Auditor-General (Corporations) observed,

> "Outstanding loan charges payable to Government by the Corporation continued to rise and as at 30th June, 1987, these amounted to Kenyan £ 15,921,329 compared to the previous year's amount of Kenyan £ 11,399,742. I am not aware of any action which the Corporation intends to take to settle its indebtedness to Government even though it has continued to explain that its failure to settle these obligations was due to the failure to repay loans by most of the local authorities to which the money was on-lent" (NHC, 1989, p.1)

The Treasury has traditionally disregarded the interest foregone on outstanding arrears and the Auditor-General's figures therefore underestimate the real value of accumulated arrears. Even so, the arrears reflect a significant concession to the NHC, which a private developer who borrows in the private finance market would not have. As noted by the Auditor-General, there are corresponding arrears owed to the NHC by local authorities and here, too, no additional interest is charged. By 1989, these arrears had grown to Kenyan £ 21 million. The effect of waiving additional interest on arrears is to reduce the *ex post* rate of return on NHC investments.

The lack of pressure to repay its debts and the virtual assurance of the continuing availability of subsidised loans have given the NHC little impetus to collect amounts owed to it by local authorities and other debtors. This position could change for in Circular No. 8 of 1990, the Treasury asks state corporations to "..ensure that debt service obligations are treated as the first charge on their revenues and other income and are discharged on time" (RoK, 1990, p.2).

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[7]   In some cases, rates of about 8 percent have been applied to higher-income housing.
[8]   See for instance NHC audited annual accounts for the years 1983, 1985, 1988 and 1989. For 1983 and 1985, the reports referred to are those of the Controller and Auditor General.

2.4.3 Government Land

Unlike private developers, the NHC has access to government land at no cost to itself. Many private developers buy land at market prices and have to include that value in house prices. Other private developers obtain government land but are required to pay a stand premium and ground rent upon allocation. The standard procedure requires the payment of a stand premium equivalent to 20 percent of the pre-development value of land. This value is determined conservatively, and is considered to be significantly below market prices (Kiamba, 1986). For the duration of the lease period, which is usually 99 years, the lessee pays the remainder in the form of a ground rent equal to 4 percent of the land value. The NHC is exempted from paying these charges, avoiding the financial cost of securing the cash outlay with which to pay the stand premium and the ground rent, and from including the value of land in its house prices. We return to this subject in greater detail in our discussion of productive efficiency (Chapter 5).

2.5 NHC as Developer and Financier

2.5.1 Development and Financing Methods

The NHC implements its housing programme either directly, or indirectly through local authorities. In determining which development and financing method to apply, the Corporation takes into account the widely varying technical abilities of local authorities. At the one extreme are the larger authorities such as Nairobi City Commission (NCC) and Mombasa Municipal Council (MMC), which are considered to have the requisite project planning and implementation capability. At the other extreme are smaller authorities which possess little in the way of technical skills.

In the past, NCC and MMC used to design and implement some of their own projects, but within cost yardsticks set by the NHC. However, the Corporation now appears to have abandoned that approach, assuming direct responsibility for the development of practically all the projects it finances. In acting as its own developer, the NHC does not engage in direct construction choosing to leave that activity to private contractors. There could be two reasons for this choice. The first is that the NHC probably is of the view that direct construction is a relatively more expensive alternative. The second is that the Corporation could only act as its own contractor at the expense of the government's social objective of supporting small domestic contractors.

In order to enlist the cooperation of local authorities the NHC resorts to what it refers to as Joint Consultative Committees (JCCs). JCCs are made up of NHC, local authority, and government officials, and their main task is to keep project implementation under continual

review. Once the nature of a project has been agreed upon, the NHC acts as a consultant and follows the traditional design process, that is, preparation of tender documents, calling of tenders, selection of a contractor and contract supervision. At key stages during this process, the JCC meets to review progress and resolve project implementation difficulties. The various development methods employed, as well as the flow of funds, are illustrated in Figure 2.1.

As the chart shows, Treasury loans to the NHC, including those from donor agencies, are channelled via the Ministry of Lands and Housing. This is accomplished by inclusion of such loans in the ministry's annual estimates of development expenditure. There are four main methods that the NHC employs to finance and develop housing. These are labelled 1 to 4 in the chart.

2.5.1.1 Method 1

Here, the NHC makes a direct loan to a local authority which then acts as the developer. Upon project completion the local authority, and not the NHC, assumes the responsibility for dwelling allocation. For rental housing, the local authority takes charge of estate management but in the case of tenant purchase housing tenants are responsible for the upkeep of their properties.

2.5.1.2 Method 2

The NHC acts as the developer on behalf of the local authority. Upon project completion, a loan equivalent to the project cost is made to the local authority. Here, too, dwellings are allocated by the local authority and the NHC assumes only oversight responsibility. Again, estate management is left to the local authority in the case of rental dwellings. tenant-purchasers maintain their own dwellings.

2.5.1.3 Method 3

The NHC acts as its own developer. It allocates dwellings, entering into sale agreements with buyers in the case of tenant purchase housing and tenancy agreements in respect to rental dwellings. This is the method used to develop two tenant-purchase projects at Kibera and Pumwani in Nairobi.[9] In the recent past, on the other hand, the NHC has not employed this method to develop rental housing.

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[9]   These projects are discussed in some detail later in the study.

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Figure 2.1 NHC: Development Methods and Flow of Funds
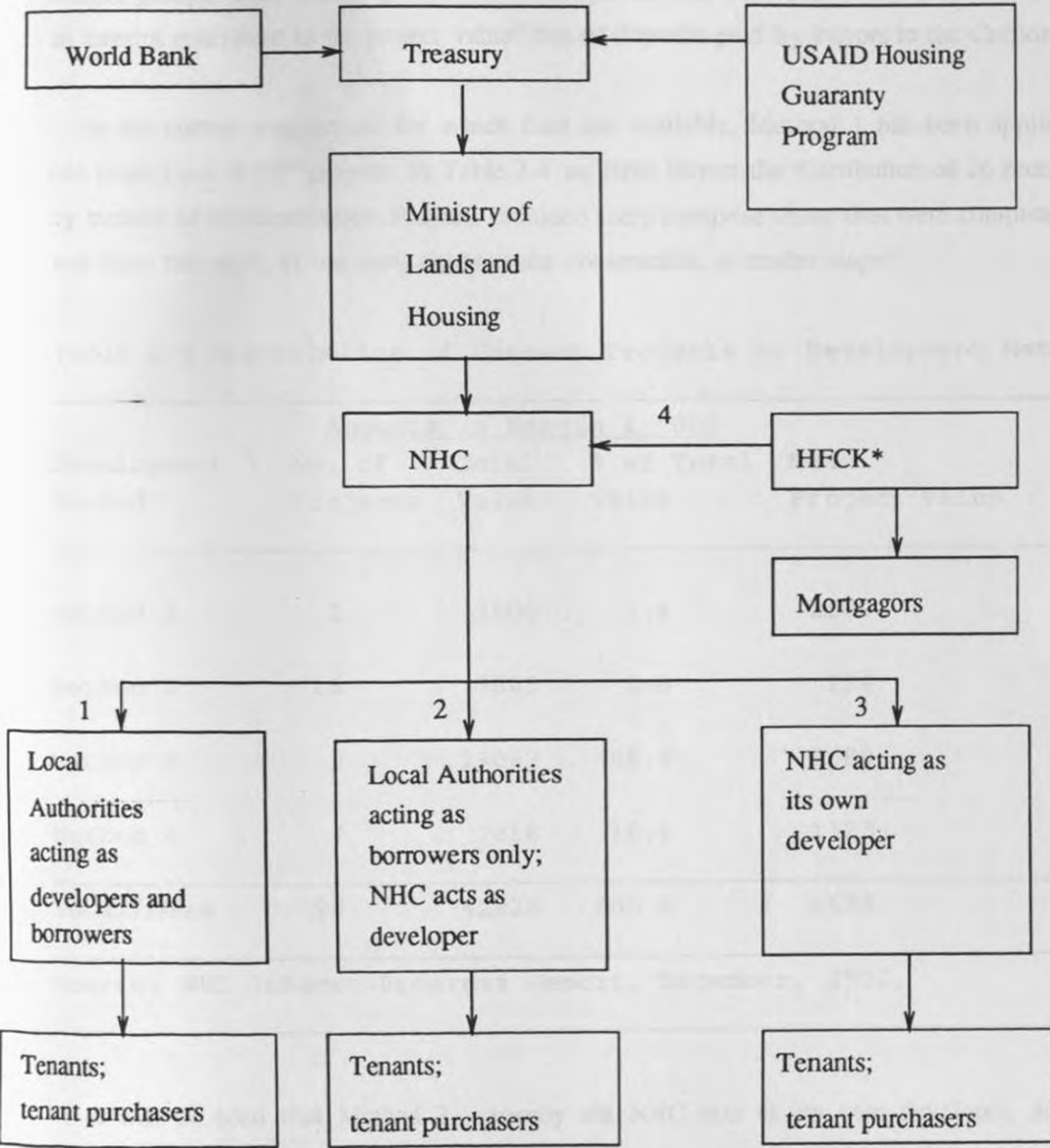
*HFCK = Housing Finance Company of Kenya

Note: Repayment flows are not shown

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Like private developers the NHC develops and sells dwellings to buyers who then obtain mortgage loans at market rates of interest, usually from the Housing Finance Company of Kenya (HFCK).[10] Almost without exception, dwellings developed under this method are for higher-income groups. Once dwellings have been completed and sold, the HFCK disburses to the NHC an amount equivalent to the project value[11] net of deposits paid by buyers to the Corporation.

In the current programme, for which data are available, Method 1 has been applied to only one project out of 92[12] projects. In Table 2.4 we have shown the distribution of 26 recent projects by method of implementation. Projects included there comprise those that were completed in 1990 and those that were, at the time, either at the construction or tender stage.[13]

Table 2.4 Distribution of Current Projects by Development Method

	Amounts in Kenyan £ '000			
Development Method	No. of Projects	Total Value	% of Total Value	Mean Project Value
Method 1	1	1500	3.6	1500
Method 2	15	3805	9.0	254
Method 3	3	29063	68.8	9688
Method 4	7	7858	18.6	1123
Total/Mean	26	42226	100.0	1624

Source: NHC Schemes Progress Report, December, 1990.

It will be seen that Method 3, whereby the NHC acts as its own developer, accounts for

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10   This company is owned by the government and the Commonwealth Development Corporation of the United Kingdom.

11   This value is determined by the HFCK.

12   This number represents schemes completed in 1988 and 1989, as well as those at various stages of planning and construction

13   Only 26 of the 92 projects qualify for inclusion in the table when this selection criterion is applied. The Method 1 project was at an advanced planning stage in December, 1990 but had not reached the tender stage. It has been included in the table because it is the only project of its type in NHC's current housing programme. The total project value is lower than the total cost shown in Table 2.2 because projects at an advanced design stage have been excluded.

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nearly 70 percent of total project value. The three projects that fall under this method are all in Nairobi at Kibera and Pumwani.[14] It is evident that their average value is atypical in that it is substantially higher than the average project value in other categories.

2.5.2 Pricing

Irrespective of the development method employed, prices are set to ensure breakeven, that is, that annual revenues are equal to annual costs. Accordingly, prices and rents are based on the direct and indirect costs of development. Overhead or indirect costs are allocated to each project in proportion to its direct costs (Price Waterhouse Associates, 1987). The general practice is then to set prices equal to the sum of the direct and allocated costs. In determining the cost and, therefore, the price of individual dwellings, it is customary to allocate total costs in proportion to floor areas.

As the NHC does not pay for the land on which it builds, its main development costs are made up of the following items:

(a) Building costs: these comprise the costs of building works.

(b) Infrastructure costs: these are made up largely of costs of water supply, sewage disposal, drainage, roads and footpaths, and electricity.

(c) Professional fees: where the NHC uses its own staff, this item consists of the implicit fees chargeable for design and supervision. Where outside consultants are retained, the fees are an explicit charge to the project. Fees usually amount to about 10 percent of the cost of building and infrastructure works.

(d) Interest on construction finance: this is an implicit financial charge equivalent to the interest foregone on construction finance. In calculating financial charges, the NHC now usually applies an annual interest rate of 13 percent.

(e) Overheads: a proportion of overhead costs is allocated to each project, as explained earlier. The costs are largely meant to cover the expenses of running the headquarters office.

Dwellings for sale on mortgage terms and some tenant-purchase houses are sold direct to individuals. Other tenant-purchase projects, as well as rental housing projects, are in effect "sold" to local authorities. Upon completion, these projects are turned over to local authorities which then have to repay the development cost to the NHC. In turn local authorities calculate the repayments and rents to be made by tenants on the basis of loan terms offered by the NHC taking account, in addition, of expenses on rates and ground rent. In the case of rental housing,

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[14]   The projects are Kibera Phase 1, Kibera Phase 2 and Pumwani.

rents also include charges for management and maintenance. The various financing terms are set out in Table 2.5.

Table 2.5 NHC: Financing Terms to Beneficiaries

Developer	Project Category	Financing Terms
NHC	**"Mortgage" Projects:** Sold direct to individual buyers.	- Deposit of 10 %. - Mortgage loans made by HFCK* on market terms, currently 19 % interest per year, with loan repayable over 15 years.
	Rental Housing Projects: First "sold" by NHC to local authority. Dwellings then let by local authority to tenants.	- Loan repayable to NHC at 6.5 % interest over 40 years. - Rent based on breakeven principle and made up of: loan charges calculated at 7 % interest over 40 years; charges for management, maintenance, rates and ground rent.
	Tenant-Purchase, and Site and Service Projects First "sold" to local authority. Local authority then sells to individual buyers.	- Loan repayable to NHC at 6.5 % over 20-25 years. - Deposit of 5-10 % - Loan repayable to local authority at 7 % interest over 15-20 years; charges for rates and ground rent; - World Bank and HGP loans at 10-14 % interest.
L.A.**	**Rental Projects** Let to individual tenants.	- Rent based on breakeven principle as above.
	Tenant-Purchase, and Site and Service Projects Sold to individuals.	- Terms similar to those given above for NHC sales to individuals. - Terms of World Bank and HGP loans as above.

* HFCK = Housing Finance Company of Kenya   ** L.A = Local Authority

We saw earlier that the NHC has traditionally favoured development Methods 2, 3 and 4 whereby it acts as the developer. The reason for this preference is not clear, but it probably has to do with the NHC's desire to retain control over the development process.

Given that in practically all cases the NHC acts as the developer, the amount of subsidy transferred to beneficiaries is influenced by the Corporation's cost efficiency. The value of land, too, contributes to the subsidy, as it is not included in the price. In addition, the subsidy level depends on loan sources since the terms of finance are different, as between ordinary Treasury loans to the NHC and loans from donor agencies. Neither the NHC nor local authorities pool their various loans with a view to offering uniform lending terms to beneficiaries. As shown in Table 2.5, loans from donor agencies are made to buyers at higher interest rates than are ordinary Treasury loans. This disparity is of some importance because, as we saw earlier, donor agencies have traditionally accounted for as much as 50 percent of the NHC's programme. In recent years, however, donor funding has declined to about 5 percent of the Corporation's programme (see Table 2.2). In effect, beneficiaries of the more concessionary Treasury loans receive higher subsidies, all other things being equal. Figure 2.2 shows the flow of subsidies to the main tenure groups. To arrive at the actual subsidy in respect of tenant-purchase dwellings it is necessary to compare the market price of a dwelling with the present value of loan repayments by a beneficiary. For rental dwellings, the subsidy is measured by the difference between the market rent and the actual rent. Here, rents are based on subsidised loan charges and are not revised to an extent that makes them comparable to market rents. Mortgage loans, on the other hand, are made on market terms and are therefore not subsidised. The transfer of subsidy is a common theme in this study and will be taken up again in some detail in later chapters. More specifically, the estimation of price subsidies will be illustrated in Chapter 6 and of rent subsidies in Chapter 7.

Besides the question of subsidy transfer, there is the separate issue of access to subsidies. Access is influenced by the number of subsidised dwellings available and the administrative criteria used to ration them. Under Methods 1 and 2, local authorities are responsible for dwelling allocation and they therefore determine, via administrative procedures, which households can gain access to the underlying subsidy. The NHC issues allocation guidelines to local authorities emphasizing that allocation should be on the basis of need subject to household ability to pay. In practice, however, there are likely to be departures from such criteria, and irregularities in allocation procedures have been noted by Stren (1978) and Lee-Smith et al. (1988). Under Method 3 the NHC is responsible for allocation and, as a result, it determines who can have access to subsidies. Here, too, there are likely to be infractions of formal allocation criteria.

FIGURE 2.2   FLOW OF SUBSIDIES

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┌──────────────┐                              ┌──────────────┐          SUBSIDISED          ┌──────────────┐
│              │      SUBSIDISED              │              │ ────────────────────────►   │              │
│   TREASURY   │ ─────────────────────────►   │              │          OWNERSHIP          │   TENANT-    │
│              │      LONG-TERM               │              │          FINANCE            │  PURCHASERS  │
│              │      FINANCE                 │              │                             │              │
└──────────────┘                              │              │          LAND SUBSIDY       │              │
                                              │              │ ────────────────────────►   └──────────────┘
                                              │     NHC      │
                                              │              │                             ┌──────────────┐
                                              │              │                             │              │
                                              │              │          RENT SUBSIDY       │   TENANTS    │
┌──────────────┐                              │              │ ────────────────────────►   │              │
│ COMMISSIONER │                              │              │                             └──────────────┘
│      OF      │      'FREE'                  │              │
│    LANDS     │ ─────────────────────────►   │              │          LAND SUBSIDY       ┌──────────────┐
│              │      LAND                    │              │ ────────────────────────►   │  MORTGAGORS  │
└──────────────┘                              └──────────────┘                             └──────────────┘
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22
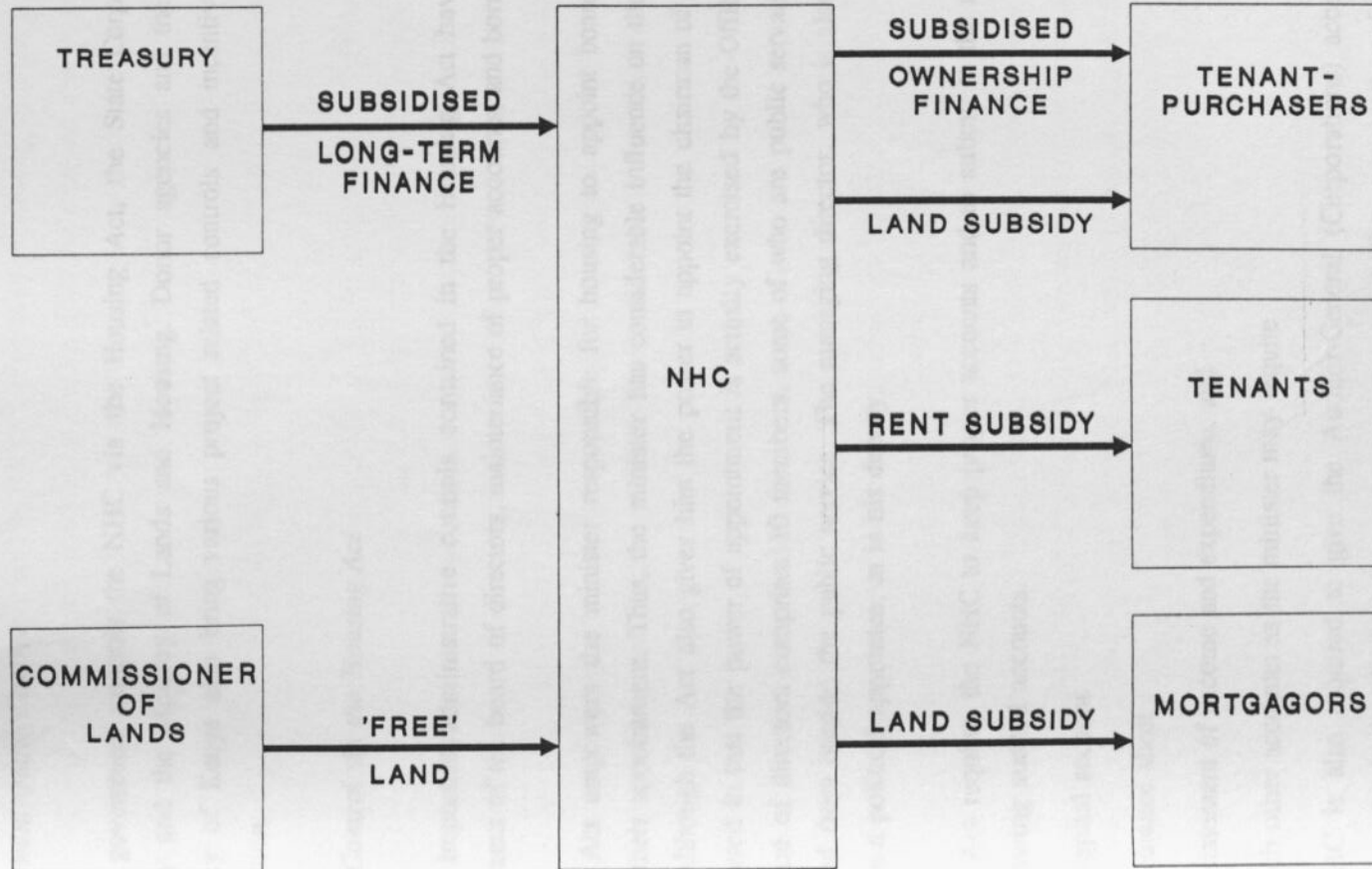
2.6 Framework of Control

The government employs a number of administrative measures to control the NHC. We now turn to these measures, as well as to the influence, though slight, that the market is likely to have on the NHC.

2.6.1 Administrative Control

The government controls the NHC via the Housing Act, the State Corporations Act,[15] the Treasury and the Ministry of Lands and Housing. Donor agencies and the Housing Finance Company of Kenya also bring various project related controls and incentives to bear on the Corporation.

2.6.1.1 Control via the Housing Act

The important administrative controls contained in the Housing Act have to do with the appointment of the board of directors, maintenance of proper accounts, and borrowing powers.

The Act empowers the minister responsible for housing to appoint board members and to revoke their appointment. Thus, the minister has considerable influence on the operations of the NHC. Although the Act also gives him the power to appoint the chairman of the board, practice has differed in that the power of appointment is actually exercised by the Office of the President. The board of directors comprises 10 members, some of who are public servants while others are appointed from outside the public service. The managing director, who is also a member of the board, is a political appointee, as is his deputy.

The Act requires the NHC to keep proper accounts and to submit to the minister every year the following audited accounts.

(a)　a capital account

(b)　a balance sheet

(c)　a statement of income and expenditure, and

(d)　such other accounts as the minister may require

The NHC is also required to give the Auditor-General (Corporations) access to the detailed records on the basis of which the accounts are prepared. Our examination of NHC files revealed examples of the types of query that the Auditor-General (Corporations) raises. They relate mainly

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15　Laws of Kenya, Chapter 446, 1987.

to the prudential use of public funds but no direct attention is given to the cost efficiency of housing production. Where queries are not answered satisfactorily, the unresolved matters are reflected in the Auditor-General's report on the annual accounts of the NHC. The Housing Act requires that this report, as well as the NHC's accounts, be laid before parliament. In principle, therefore, the operations of the NHC are open to the scrutiny of parliament.

The Housing Act also contains provisions regarding borrowing. Besides the annual loans that the NHC obtains from the government, loans from other sources are also permitted but only with the consent of the housing minister. In practice, given the traditional need to control public sector borrowing, the approving authority is the Treasury.

2.6.1.2 Control via the State Corporation's Act

In an effort to strengthen its control over all public enterprises, the government introduced in 1986, the State Corporation's Act. The Act contains a number of provisions that are similar in intent to those set out in the Housing Act. First, a state corporation cannot borrow without the consent of the relevant minister. Such borrowing is also subject to conditions set by the Treasury. Second, each state corporation is required to prepare every year, estimates of revenue and expenditure. No expenditure may be incurred until these estimates have been approved by the relevant minister and the Treasury. Third, the Act requires that the accounts of every state corporation be audited by the Auditor-General (Corporations). Fourth, the Act establishes an Inspector of State Corporations (ISC) to monitor and review the affairs of public enterprises. Finally, the Act establishes a State Corporations Advisory Committee with the power to review and investigate state corporations. In consultation with the Attorney General and the Treasury, the committee may also recommend the dissolution of a corporation.

The Act appears to emphasize prudence in the use of public funds by state corporations. It is the case, therefore, that the Act is more concerned with financial probity in the first instance than with the accomplishment of social goals. Taking this argument a step further, it seems that as long as the NHC follows approved financial procedures it is unlikely that its housing programmes would come under scrutiny.

2.6.1.3 Control by the Treasury

Working within the context of the State Corporation's Act the Treasury attempts to control the NHC, and other public enterprises alike, by means of regulations concerning a benchmark rate of return on investments, financial targets, annual budgets, and physical indicators of performance. In the last few years, the policy of the Treasury has been to require that all new investments by state

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corporations generate a net economic rate of return higher than 15 percent.[16] In its most recent circular on the subject, the Treasury had the following to say:

> "It is important to ensure that all investments and capital expenditures of state corporations generate a rate of return in excess of 15 % on a discounted cash flow basis (D.C.F.). Where, however, a reliable estimate of the rate of return cannot be quantified in financial terms or the rate of return is less than 15 %, the state corporation concerned should present adequate justification of the proposals, in terms of other criteria such as the socio-economic impact of the proposal." (RoK, 1991, p.2).

It will be seen that the Treasury does make two qualifications. The first concerns those projects whose rate of return cannot be quantified in financial terms. The second relates to projects whose rate of return is lower than 15 percent. In both cases, it would appear that projects may be justified in social terms. No mention is made, however, of the influence of risk on the expected rate of return.

The circular also requires state corporations to submit for approval, annual budgets[17] together with a summary of their profit and loss account, and balance sheets for the preceding four years. This means that the Treasury's intention is to make forward- and backward-looking reviews. Annual budgets comprise both operating and capital budgets. For non-commercial enterprises such as the NHC, the operating budget gives estimates of expenditure and income. The capital budget, on the other hand, shows sources and application of funds, as well as estimates of the rate of return. It is by means of the budgetary process that the Treasury controls borrowing by the NHC.

Other performance indicators comprise financial ratios, as well as such physical indicators of capacity utilisation and output as may be appropriate to the corporation in question. The financial ratios suggested by the Treasury are of general application to all state corporations and not all may, in the circumstance, be relevant to the NHC. The four main groups of financial ratios are: solvency ratios, which investigate the relationship between current assets and current liabilities; gearing ratios, which are concerned with the relationship between debt and equity; activity ratios, which compare sales to assets; and profitability ratios, which consider the relationship between profit and such magnitudes as sales and capital employed. The NHC is expected to suggest which of these ratios should apply to its operations but it has not yet done so. Similarly, physical indicators of performance have not been agreed with the government.

A financial return on NHC assets has also not been set. However, given that the NHC bases

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[16] Our enquiries at the Treasury indicated that this requirement had been introduced about 4 years ago. The first documented evidence we could find was in Treasury Circular No. 10 of 1988 (RoK, 1988).

[17] State Corporations are also required to submit their projected budgets for approval.

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its prices on average costs, subject to a price constraint imposed by the market,[18] it could be assumed that its intended financial objective is to break even. There is also support in the literature that such a financial goal is usually set for public enterprises (Henley, et al., 1986; Harrison, 1988). A financial target would be superfluous if the financial return implicit in a breakeven policy were the rate acceptable to the Treasury.

2.6.1.4 Control by the Ministry of Lands and Housing

The Ministry of Lands and Housing, the NHC's sponsoring department, exercises its control by several means. First, the permanent secretary is a member of the board of directors and is therefore able to bring his views to bear on the transactions of NHC committees. Second, the ministry plays a leading role in discussions of NHC annual budgets with the Treasury. Prior to such discussions, the ministry is expected to vet the Corporation's proposed budget and, by so doing, to influence both its size and intended use. Third, the ministry prepares, once every five years, a housing chapter for inclusion in the national development plan. The housing chapter usually contains statements of policy, as well as investment programmes, both of which are meant to have a substantial effect on the operations of the NHC. In our evaluation of performance (Chapter 8), we shall investigate whether or not there have been significant divergences between development plan targets and the output of the NHC.

2.6.1.5 Control by Donor Agencies

Control by donor agencies is exemplified by the United States Agency for International Development (USAID).[19] Earlier, we saw that the NHC has obtained a number of loans under the USAID Housing Guaranty Program. An important requirement of the project implementation agreements that are customarily made with the USAID is that project costs should not exceed a predetermined limit. This limit is quite often defined in terms of the cost per dwelling. Should the cost limit be exceeded for a given project component, there is the underlying penalty that that component becomes ineligible for funding. Our examination of correspondence between the NHC and the USAID showed that the need to comply with project agreements had had substantial influence on NHC project decisions. In some instances, the NHC had been compelled to re-design projects in order to reduce costs. In other cases, tender procedures had come under considerable scrutiny. The tenant-purchase (Type 1) projects in Table 2.2 were financed under this programme and the lower cost levels achieved relative to other tenant purchase projects probably reflect, to some degree, the cost discipline imposed by the donor agency. We will have more to say on the

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[18] At the limit, given the NHC's subsidised ownership finance to beneficiaries, the Corporation could produce at costs higher than the cost efficient level and still manage to sell its dwellings. The market constraint may therefore not be very effective.

[19] The World Bank has been the other important donor agency in Kenya's housing sector.

relative cost efficiency of these projects in our examination of productive efficiency (Chapter 5).

2.6.1.6 Incentives by the Housing Finance Company of Kenya

It is common for the NHC to sell some of its dwellings via mortgage loans made to buyers by the Housing Finance Company of Kenya. In spite of its public ownership, the HFCK appears to be risk averse and its loans will not usually exceed 85 percent of the value of a dwelling. Where the cost of a dwelling exceeds HFCK's estimate of value, the buyer must make an additional initial payment equal to the difference between cost and the estimated value. For this reason a cost inefficient developer will find it difficult to sell dwellings via the HFCK. It could be argued, therefore, that the NHC has an incentive to contain its development costs in order to ensure parity between its costs and HFCK's valuation. This valuation reflects a conservative estimate of the market price.

2.6.2 Administrative Controls: A Concluding Note

The powers of the various controlling agencies suggest that the government's policy is to restrict the autonomy of public enterprises, especially with a view to limiting borrowing and ensuring the judicious use of public funds. These powers also overlap to some extent. For instance, both the Housing Act and the State Corporation's Act contain provisions on the preparation and approval of annual budgets, as well as on auditing of accounts. Further, the Ministry of Lands and Housing, the Treasury, and the Inspector of State Corporations are all supposed to monitor and control the NHC. Whilst this sharing of responsibilities may have been considered necessary it probably introduces some degree of conflict and ambiguity into the control regime.

The administrative controls discussed here appear to give the NHC little freedom of decision. Quite how effective and compatible the various controls are, however, is a different matter. To start with, the NHC probably has better information on its operations than any of the controlling agencies. Second, NHC financial accounts, which comprise an important source of information,[20] are prepared on a historic cost basis. This means that there is a divergence between the accounting conventions used and the economic concept underlying the rate of return set by the Treasury. The accounts therefore would not allow the Treasury to determine, *ex post*, whether or not the required rate of return had been achieved. In any case, as Edwards, Kay and Mayer (1987) point out, there is no straightforward relationship between the accounting rate of profit and

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[20] This is especially so where, as is the case for state corporations, there is no share price on the basis of which performance could be evaluated.

the economic rate of return.[21] Further, there are no guidelines to show how the trade-off between social objectives and the required rate of return will be determined within the context of specific sectors such as housing. As a result, the Treasury is likely to face difficulties in enforcing its benchmark rate of return. Third, no formal pricing controls are imposed on the NHC, though this may be unnecessary if it is assumed that the housing market is generally competitive and that the Corporation should break even. In other respects, the Treasury will have information superior to that available to the NHC, given its access to data from other state corporations. For instance, unit expenditures on staff could be expected to be more or less uniform across public enterprises and atypical expenditures would therefore attract attention. As a result, NHC's discretion to incur higher unit expenditures on staff is likely to be curtailed.

Besides the concern for prudential control, there does not appear to be effective monitoring of the accomplishment of social goals. As a result, the NHC does have considerable freedom of decision. In this context it is worth emphasizing our earlier finding that, contrary to government policy, the NHC's programme has shifted almost wholly towards higher income housing.

In our discussion of allocative efficiency in Chapter 6 we shall compare the rate of return on NHC projects with the rate of return set by the Treasury. Further, our evaluation of performance in Chapter 8 will show the extent to which the NHC has been able to meet its objectives.

2.6.3 Market Controls

As the NHC is protected from the sanction of bankruptcy, market controls cannot be expected to have a substantial impact on its operations. Its access to concessionary loans and government land give it considerable insulation from market forces. Moreover, the Corporation has traditionally sold nearly all of its output in the local authority sector and not in the market. Recently, however, the proportion of NHC expenditure on dwellings for sale on mortgage terms has grown substantially, raising the proportion of output sold in the market.

In the input market for building work, as shown in Table 2.6, the NHC accounts for a rather small proportion of total construction activity. Disregarding land and finance, therefore, the NHC faces a generally competitive input market.[22]

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[21] There are two main difficulties of relating the two. First, the economic rate of return is based on the net cashflow over the life of a project. The accounting rate of profit, on the other hand, relates to one year. Second, there are divergences between the accounting and economic concepts used in the measurement of costs and benefits. Edwards et al. do show, however, that a cross-section accounting rate of return which has a systematic relationship with the economic rate of return can be derived from financial accounts.

[22] Markets for such building materials as cement and glass are not competitive.

Table 2.6 NHC's Share of Construction Output

| Year | Amounts in Kenyan £ million | | | | |
	1985	1986	1987	1988	1989*
Private Buildings	26.6	21.8	33.5	40.7	40.4
Public Buildings	1.1	3.8	2.4	3.1	2.8
Road Construction**	53.2	50.1	42.0	41.6	97.4
NHC Output	2.9	2.0	3.8	1.5	6.5
Total	83.8	77.7	81.7	86.9	147.1
NHC Output as a % of the total	3.5	2.6	4.7	1.7	4.4

Sources: Economic Survey, 1989, 1990; Statistical Abstracts,
         1988, 1989.
* Figures for this year are provisional
** Amounts are for financial years 1984/85, 1985/86 etc.

The table demonstrates that the Corporation's relative expenditure in the building and construction industry is very small. Although the NHC is, in principle, a price taker in the input market its access to concessionary finance means that its input costs could be lower than those of a private developer, the outcome depending on how competitive the Corporation's bidding procedures are.

2.7 Summary

This chapter described the NHC and its operations. Following an account of the Corporation's immediate and wider social objectives, we examined its past and current housing programmes and concluded that there had been a major shift from lower-income housing to higher income housing. Next, we described the terms upon which the NHC gains access to government finance and land. We noted that it borrows from the government on highly subsidised terms and that land is made available free of charge. Private developers, on the other hand, generally face market prices in their acquisition of finance and land.

The role of the NHC as a developer and financier was discussed, as were the subsidised terms offered to buyers and tenants. We saw that the level of subsidy depends not only on land value and the Corporation's cost efficiency but on loan sources as well.

Finally, we turned to the government's control framework for the NHC. We saw that this framework consists primarily of administrative measures since market forces, from which the NHC is protected, are unlikely to have a significant impact. We noted that the Treasury had set, for all state corporations, an economic rate of return of at least 15 percent on new investments. Even so, the Treasury had anticipated a lower rate where such an outcome could be justified on the basis of social costs and benefits. Although no explicit financial targets had been set, we argued that the main financial objective of the NHC was to break even. We concluded that in spite of the controls imposed on it, the NHC had considerable freedom of decision.

3. ANALYTIC FRAMEWORK

3.1 Introduction

The purpose of this chapter is two-fold. The first aim is to set out an analytic framework within which to evaluate the NHC, directly, as well as in comparative terms. The second is to review literature relating to the behaviour and control of firms. Although there are many theoretical models of the firm, making an eclectic approach inevitable, two main theories could be distinguished. There is, on the one hand, the traditional or marginalist theory whose concern is not the behaviour of a specific firm, but the overall behaviour of profit maximising firms in a market system (Machlup, 1967; Demsetz, 1983; Putterman, 1986). On the other hand, are theories of the firm such as those proffered by Baumol (1959), Cyert and March (1963), Marris (1964), Williamson (1964, 1985), Jensen and Meckling (1976), and Hart (1989). What these approaches have in common is their attempt to develop a better understanding of how real business organizations work. In particular, the more recent theories have defined the firm as a set of contracts between economic agents and have, in this regard, highlighted the importance of information and uncertainty.

We shall proceed as follows. First we are going to examine the traditional theory of the firm with a view to highlighting the conditions necessary for the attainment of productive and allocative efficiency. Second, we will look at the predictive (i.e. managerial) theories proposed by Baumol, Marris and the early Williamson, as well as the generally non-predictive (i.e. behavioural) models of Simon (1959) and Cyert and March (1963). Third, we shall examine recent managerial theories and their insights into the likely differences in behaviour between public enterprises and private firms. Finally, we shall turn to the direct evaluation of public enterprises.

3.2 The Traditional Theory of the Firm

Our starting point in setting out an analytic framework will be an examination of the traditional theory of the firm. This is a narrowly defined theory whose concern is the behaviour of the profit maximising firm. It is important, nonetheless, to establish the extent to which the theory can be applied to the evaluation of a public enterprise. In particular, we shall be interested in the conditions that the theory lays down for the achievement of productive and allocative efficiency. Our review is based on the theoretical principles set out in received microeconomic theory.[1]

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[1]   See for instance Lancaster (1974), Gravelle and Rees (1981), and Varian (1990).

The goal of the perfectly competitive firm in traditional microeconomic theory is to maximise profit, at least in the long-run, for without such a strategy it cannot survive. The prices at which the firm buys its factor inputs and those at which it sells its output are outside its control. A perfectly competitive market requires a large number of producers, easy entry and exit of firms, homogeneous products, and perfect knowledge. The latter condition, which departs substantially from reality, means that the firm of traditional theory operates in a world of full information and no uncertainty. Later, in our review of recent managerial theories, we shall see the important role played by information asymmetries.

The polar case to perfect competition is monopoly. The monopolist restricts output and is thus able to determine the price at which to sell it. Besides perfect competition and single product monopoly two other market structures may be distinguished. These are monopolistic competition and oligopoly. In monopolistic competition there are many firms selling products that are close substitutes. The number of firms selling any one product is sufficiently large so that there is no direct rivalry among firms. In oligopoly, on the other hand, there is a small number of firms selling either homogeneous or differentiated products. Changes in output or price by one firm elicit a reaction from other firms. To survive in markets that are not perfectly competitive, firms need not be productively efficient.

3.3 Efficiency

Three aspects of efficiency may be distinguished. The first is productive efficiency, which has to do with the degree to which a firm minimises production costs for a given level of output; or alternatively, the extent to which it maximises output for a given level of production costs. The second is allocative efficiency which requires that prices reflect costs. The third is the distinction between private and social efficiency. Private efficiency disregards costs and benefits external to the firm. Thus, a firm whose products pollute a river imposes costs on other uses of the river, for instance fishing and recreation. The firm may, therefore, be efficient in private terms, but to the extent that it does not take these external costs into account, it is socially inefficient. Our analysis first looks at efficiency within the context of private costs and benefits. Later, we consider social costs and benefits and their implications for efficiency.

For productive efficiency to be attained, two conditions must be met. The first concerns technical efficiency. Technical efficiency requires the use of minimum quantities of each factor input for a given mix of inputs and level of output. The second condition is that given the relative prices of inputs, the selected technique of production must be one that minimises production costs. By definition, allocative efficiency requires that there be no productive inefficiency. If there were, the possibility would exist of increasing output by reallocating

resources. In contrast, however, productive efficiency can co-exist with allocative inefficiency. An example is the monopolist who is productively efficient but who restricts output and is therefore able to charge prices higher than marginal costs.

3.4 Technical Efficiency and Production Functions

We have seen that there are two sides to productive efficiency, that is technical efficiency and "factor price" efficiency. We deal with technical efficiency in this section and introduce prices later.

Microeconomic theory assumes that firms are technically efficient, with their output given by the production function. The production function shows the maximum output obtained from a given level of inputs or, alternatively, the least inputs required for a given output. It could, therefore, be expressed thus,

$Q = f(x_1, x_2 \dots x_n)$ where Q is the maximum output from inputs x_1 to x_n.

In production each input can, up to a point, be substituted for another without a change in output. At the margin, the rate at which this can be done is referred to as the marginal rate of technical substitution. Input substitution is important to the firm, especially when relative changes occur in prices of factor inputs. To retain the same rate of output, a firm will use a new mix of inputs ensuring that the new price ratio of any two inputs is equal to their marginal rate of technical substitution.

Another important aspect of production has to do with returns to scale. Returns to scale refer to the "relationship between changes in the physical quantity of output and changes in the physical quantity of all inputs simultaneously and in the same proportion" (Lancaster, 1974, p. 92). In the short run, the firm is not able to vary all its inputs, especially its plant and equipment. In the long-run, however, all inputs are variable and the firm is therefore able to change its production methods. An important question is what happens to output were the firm to increase its inputs simultaneously in the same proportion. Three outcomes are possible. First, output may increase in the same proportion as the inputs. This is what is referred to as constant returns to scale. Second, output may increase by a larger proportion than the inputs. This is the case of increasing returns to scale. Third, output may increase by a smaller proportion than the inputs resulting in decreasing returns to scale.

There are various reasons why constant returns to scale are not universal as may appear to be the case on intuitive grounds. As a firm grows larger, it is able to use techniques that are not

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available to the small firm. For this reason, the larger firm may enjoy increasing returns to scale. On the other hand, as a firm grows in size difficulties of coordination emerge and decreasing returns to scale could set in.

So far, we have restricted ourselves to the relationship between physical quantities of inputs and outputs. We have also seen that up to a point, one input can be substituted for another without affecting the rate of output. Next, we introduce input prices into the production process.

3.5 Productive Efficiency and Cost Functions

We saw earlier that productive or cost efficiency is attained when a firm minimizes production cost for a given level of output; or alternatively, the firm maximises output for a given level of production cost. We now want to investigate the relationship between input costs and output. This relationship is expressed in the form of a cost function. Such a function shows the minimum cost of attaining a specified level of output or conversely, the maximum output that can be obtained from a given outlay. The problem facing the firm can be specified as follows: minimize the production cost C of output Q given n factor inputs x_1 to x_n that have prices w_1 to w_n. In algebraic form, the optimization problem is:

Minimize $C = w_1 x_1 + ... + w_n x_n$

Subject to $Q = f(x_1, ... x_n)$

Alternatively, the problem could be specified as: maximize output Q given n factor inputs x_1 to x_n that have prices w_1 to w_n and subject to an outlay C. Thus,

Maximize $Q = f(x_1, ... x_n)$

Subject to $C = w_1 x_1 + ... + w_n x_n$

Assuming a two input production process and a given outlay, the firm attains productive efficiency at the point where the marginal rate of technical substitution of, say, capital for labour is equal to the input price ratio of capital to labour.

We saw earlier that in the short-run a firm cannot vary some of its inputs. This means that in the short-run, the firm faces both fixed costs and variable costs. Fixed costs refer to those input costs that do not vary with output. Variable costs, on the other hand, refer to the costs of variable

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inputs such as wages and payments for raw materials which vary directly with output. Total cost is the sum of fixed and variable costs. In the long-run, the cost functions of a firm depend both on returns to scale and on the prices of inputs. If we assumed constant input prices, for instance, a firm that enjoys increasing returns to scale would experience economies of scale. In other words, its long-run average cost of production would, up to a point, decrease with output. Least-cost production, at which productive efficiency is attained, is therefore determined by both size of plant and input prices. A competitive firm may use a suboptimal plant size because it is not able to vary its fixed inputs in the short-run.[2]

In the preceding analysis, we have assumed a single-product firm where all costs are assignable to the product in question. For the multi-product firm,[3] the cost function is said to be separable where the cost of producing one good does not depend on the cost of producing the other goods. As a result, it is possible to assign production costs among the respective goods. Where the total cost depends jointly on the amounts of all goods, the cost is said to be non-separable and cannot be assigned among the goods produced. A third possibility is where the cost function is non-separable at one stage of production but separable at another. Here, the function is said to be weakly separable and the underlying joint costs can only be assigned arbitrarily, as is the practice in accounting. The attributes of the cost function described here allow firms to exploit what are referred to as economies of scope, that is, the economies brought about by producing in the same firm, a range of goods whose cost function is either non-separable or weakly separable. This analysis is relevant to our study because the NHC and private developers are multi-product firms. Both types of firm produce dwellings in different locations and, in the case of the NHC, other products such as technical assistance to local authorities are produced jointly with dwellings.

3.6 Allocative Efficiency

The perfectly competitive firm is allocatively efficient in that it produces up to the point where marginal revenue, that is price, is equal to marginal cost. At that level of output and price, both profit and consumer surplus are maximised. A comparison with production under monopoly will serve to illustrate allocative inefficiency. The monopolist restricts output, producing at the point where marginal revenue is equal to marginal cost but charging a price higher than marginal cost. The lower output and higher price bring about a loss in consumer surplus and are therefore

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2   Another reason, which is not directly relevant to the study, is that in an imperfect market a suboptimal plant size may be the result of what is referred to as a strategic move. A strategic move by a firm, following Schelling (1960), is one that influences the actions of potential competitors in a manner favourable to the firm. Thus, a firm's investment in extra capacity could constitute a strategic move in that once this action has been taken, it is rational for the firm to react aggressively to the threat of entry by other firms. It is then argued that the strategic move and the potential for aggressive behaviour act as disincentives to entry.

3   This section is based on Gravelle and Rees (1981).

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allocatively inefficient.[4] It should be pointed out, however, that according to the theory of contestable markets the threat of hit-and-run entry by other firms could act as a proxy for competition thereby inducing the monopolist to be more allocatively efficient (Baumol et al., 1982). Perfect contestability requires that firms have access to the same technology, that there be no barriers to immediate entry so that the incumbent has no time to adjust his behaviour in anticipation of such entry, and that there be no sunk costs. The last requirement means that all fixed costs are recoverable. These conditions are very stringent and therefore difficult to meet in practice. In other words, it is difficult to meet the necessary condition for allocative efficiency, that is, that price be equal to marginal cost.

3.7 Social Efficiency

Our analysis so far has concerned itself with the private efficiency of the profit maximising firm. We have disregarded in that analysis, the divergence between private costs and benefits, on the one hand, and social costs and benefits, on the other. The term "social" is used here to refer to costs and benefits to society.

Governments usually establish public enterprises in order to meet the immediate objectives of providing a given set of goods and services, as well as a means of attaining wider social objectives than can be entrusted to the profit maximising firm operating without any form of government intervention. The more important of these social objectives have to do with correcting market failure and modifying the distribution of income (Rees, 1984). In the traditional, perfectly competitive market system, there would be no divergence between the profit maximizing objective of the private firm and the social objectives of the public enterprise, but only as long as the distribution of income and wealth are not considered important. In actual market systems, however, there are important areas of market failure.

It is usually argued that although housing does not inherently qualify for public provision on the grounds of market failure, it has other features that justify public intervention (Stafford, 1978; Lansley, 1979). These imperfections, which are probably best addressed by the public sector, have to do with inelastic housing supply, transaction costs to buyers and renters, and imperfect information. In particular, housing for lower-income groups is a merit good which, in the absence of state intervention, may not be consumed at levels deemed adequate by society. Whitehead (1984) emphasizes that public intervention does not necessarily mean public provision and concludes that private provision is likely to be suitable only for housing that meets socially

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[4]   If, in addition, monopoly brings about higher production costs than would be the case under competition the output is lower still and the price higher. The degree of allocative inefficiency is therefore larger (Comanor and Leibenstein, 1969). These writers, however, emphasize that these conclusions are based on partial equilibrium analysis. In the circumstance, they point out, a shift from monopoly to competition in one area may not improve welfare if resources are drawn from other uses where they had a higher value.

acceptable minimum standards and for which there is effective demand. Public provision, however, is necessary to meet the needs of those who cannot afford minimum standard housing. In as far as rental housing is concerned, the public sector may be a better landlord, at least in terms of enforcing the tenancy contract and subsidising low income households.

We will now look at greater length at some aspects of market failure that have implications for this study. These are externalities, declining cost industries and, imperfect information and uncertainty.

3.7.1 Externalities

According to Lancaster (1974 p.315), an externality "is an effect of one firm's or individual's actions on other firms or individuals which is not directly intended as such and is thus a by-product of the originator's actions rather than a direct one". The main feature of externalities is that of untraded interdependence. In other words, the effects of externalities on other economic agents are direct and are not conveyed through the mechanism of price, hence market failure. On the other hand, there would be no market failure if the property rights to externalities were well defined and could, therefore, be traded. Externalities are considered positive if they confer benefits to other economic agents and negative if they impose costs. Since private, profit maximising firms might not take external costs and benefits into account, a distinction is usually made between private efficiency and social efficiency. It will be recalled that private efficiency requires that the rate of a firm's output be such that price is equal to marginal cost. The equivalent condition for social efficiency is that marginal social benefit be equal to marginal social cost. It follows from this reasoning that a divergence between the prices set by a public enterprise and market prices do not necessarily reflect allocative inefficiency.

3.7.2 Declining Cost Industries

In a single-product enterprise, economies of scale bring about declining long-run costs. This means that the long-run marginal cost curve lies below the long-run average cost curve. On the other hand, in multi-product firms economies of scope, as well as economies of scale, will lead to declining costs. For declining cost industries, therefore, the use of the marginal cost price means that sales receipts are less than costs. This is typical of such industries as electricity, and telecommunications. In this case, both allocative and productive efficiency require a single firm. Without government intervention the declining cost industry tends to develop into a monopoly since the first entrant is able to undercut potential competitors. As a result, both allocative and productive efficiency are not assured.

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The perfectly competitive market of traditional theory assumes that producers and consumers have perfect knowledge. As a result, economic agents transact in a world of certainty and full information. Real markets, however, are characterised by imperfect information and uncertainty. This means that, first, acquisition of information is not costless and second, some economic agents will have more information than others on the attributes of factor inputs, and goods and services. In the circumstance there will be a problem of asymmetric information which might impede transactions. Imperfect information also means an uncertain future, making long term contracts infeasible (Williamson, 1986). At the same time, Williamson adds, short term contracts may also be unsuitable especially where there are only a few suppliers. Again, potential parties to a contract will find it difficult to transact.

3.8 The Early Managerial and Behavioural Theories

What we have examined so far is the traditional theory of the firm. We shall now turn our attention to the early managerial and behavioural theories. We start with managerial theories which, like the traditional theory, are predictive.

3.8.1 Managerial or Predictive Theories

The main features of the early managerial theories of the firm are their emphasis on separation of ownership from control, the divergence between the utility functions of owners and managers, and the assumption that managers exhibit discretionary behaviour (Hay and Morris, 1979). The theories may be said to comprise, as a special case, the traditional theory of the firm which has profit as the maximand. The main variants of managerial theories have different maximands. These are sales revenue (Baumol, 1959), rate of growth (Marris, 1964) and a more general utility function in which salaries and perquisites are the main arguments (Williamson, 1964). Although these variants do not have profit maximization as the main objective, profit nevertheless appears as a constraint. In other words, firms are assumed to pursue their objective functions subject to attaining a minimum profit.

The main strength of managerial theories is that they are predictive. This means that they will predict the direction of change in the behaviour of a firm as the firm's environment changes.

Behavioural theories study decision making within firms, primarily by means of a descriptive approach. One of the early versions is that of Simon(1959). His hypothesis is that managers "satisfice", that is to say, they seek a satisfactory level of profit. The limited cognitive ability of decision makers, which Simon refers to as "bounded rationality", is said to rule out maximising behaviour in an uncertain environment. The main behavioural model, built on the work of Simon, is that of Cyert and March (1963). These commentators hypothesize that firms have many, often conflicting, goals which are set by various coalitions within the firm, for instance workers and management. The goal of workers may be higher wages, implying lower profits for shareholders, and that of managers, status and power. Conflict resolution is achieved via bargaining. It is contended that firms do not pursue profit maximization because uncertainty and inadequate information do not allow them to determine the marginal conditions that must be fulfilled to attain such a goal. Here again, managers are assumed to "satisfice", their decisions guided by simple rules of thumb that allow them to achieve satisfactory results. They do this by setting themselves targets based on previous performance. The behavioural model explains how these rules are determined and how they evolve. As a result, this approach is well-suited to explaining repetitive decision making within stable organizations.

The model is not necessarily incompatible with profit maximization since the targets set may at times tend towards those of a profit maximising firm. However, a major shortcoming of the model is that it lacks generality. This means that it is not able to predict changes in behaviour as economic circumstances change. As a result, behavioural theories have not been widely applied in economics (Clarke and McGuinness, 1987). There appears to be agreement, nevertheless, that managerial and behavioural theories are complementary, as they seek to answer different questions concerning the firm (Cohen and Cyert, 1965).

3.9 Relevance of Predictive and Non-Predictive Theories

In this section we inquire into the relevance for our study of the traditional theory and managerial theories, on the one hand, and the behavioural or non-predictive theories, on the other hand.

In order to retain its predictive power, the traditional theory restricts itself to an abstract account of the firm. It therefore does not concern itself with detailed features of the real firm, such as ownership, internal organization, and control (Gravelle and Rees, 1981). Further, the theory assumes that there are no conflicts in decision making, that the firm has perfect information, and that it operates in a world without uncertainty. In spite of its abstract nature, the

theory is highly relevant in that it is able to predict how firms might behave as the economic environment changes.

Turning to managerial theories, we have seen that they emphasize separation of ownership from control, divergence in the utility functions of owners and managers, and managerial discretion. However, the maximands put forward by Baumol (1959) and Marris (1964), that is, sales revenue and rate of growth, respectively, do not appear to be particularly relevant to the NHC though they may be important to private developers.

On the other hand, the managerial model advanced by Williamson (1964), whose maximand is a more general utility function composed largely of salaries and perquisites appears to have scope for application to a study of the NHC. In private firms, the potential for managerial discretion is given by the difference between the actual profit and the minimum profit that must be made to satisfy shareholders (Williamson, 1964). As the NHC does not make other than nominal profits, this measure of managerial discretion is not relevant. However, the NHC does receive substantial subsidies mainly via land and low-interest government loans. It could be argued that such subsidies give NHC managers room for discretionary behaviour, perhaps performing much the same role as extra profits do in private firms. Consequently, tests for such behaviour could be devised, for instance, in the form of performance indicators that examine managers' consumption of salaries and perquisites, as well as the growth of operating costs. We submit therefore that Williamson's managerial model has more desirable properties than the other models reviewed.

Turning to the behavioural theory, we have seen that it is more concerned with describing and accounting for the behaviour of decision makers, and that emphasis is placed on bargaining as a means of conflict resolution. This probably offers a sensible approach to understanding what takes place in public enterprises. It could be hypothesized that in such firms policies are determined via a bargaining process involving different coalitions comprised mainly of public servants and politicians. It seems, therefore, that the behavioural theory has a contribution to make to the study of a public enterprise such as the NHC. However, as we pointed out earlier, the theory lacks generality and predictive power, and testable hypotheses are not easily formulated.

Although the early managerial and behavioural theories could give insight into a study of the NHC, it is the more recent managerial theories, as we see in the next section, that appear more suitable.

3.10 Recent Managerial Theories

Unlike traditional economic theory, which views the firm essentially as a production function, recent managerial theories define the firm as a nexus of contracts (Jensen and Meckling, 1976; Holmstrom and Tirole, 1989). In other words, the firm is seen to comprise contractual relationships between agents, designed to minimize transaction costs. These are the "thinking, planning and contracting costs that accompany any transaction" (Hart, 1989, p. 1760). Recent theories appear to bring together managerial and behavioural attributes of the earlier theories in that they, on the one hand, assume utility maximization and, on the other, emphasize the divergent interests of contracting parties. Further, unlike the earlier managerial theories, they bring out the role played by various constraints and incentives in influencing firm behaviour, especially in an environment dominated by asymmetric information (Clarke and McGuinness, 1987).

In the context of the above definition of the firm, two perspectives may be distinguished that are of particular relevance to a study of the relative behaviour of public and private enterprises.[5] These are the property rights theory and the principal-agent theory. Property rights refer to the access of each individual to the use of resources (Furubotn and Pejovich, 1972, 1974), or as Brown and Jackson (1982 p.24) put it "property rights give an individual the right of ownership over some commodity (property) and thus the right to exclude others from enjoying the benefits that the commodity provides". These commentators and others such as Demsetz (1967) and De Alessi (1969) argue that the behaviour of various types of firm is a function of the attenuation or restriction of property rights. Thus, it is hypothesized that the greater attenuation of property rights in public enterprises results in behaviour that is different from that of private firms. In the case of the owner-managed firm, the property rights of the owner-manager include entitlement to the residual, the right to revise the membership of the firm and the right to dispose of his property rights (Alchian and Demsetz, 1972). In the public liability company, on the other hand, shareholders have reduced ability to change the membership of the firm and their ability to monitor management is much diminished. We shall examine this monitoring role further in the context of the principal-agent theory.

In the principal-agent theory, a monitoring problem arises because of two main reasons. To start with, the objectives of shareholders (principal) diverge from those of the manager (agent). Without the right incentive structure, therefore, the agent will not behave in accordance with the principal's interests. Second, the principal is not able to observe the agent's actions, for instance, level of effort (Holmstrom and Tirole, 1989). Deprived of full information on the agent's actions,

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5   One of the central concerns in the literature, going back to the work of Coase (1937), is to explain how the boundaries of the firm are determined. In other words, why are some transactions carried out within the firm and others across markets? Our interest in the theory of the firm is different in that it lies mainly in the relative behaviour of public and private firms, and only to a lesser degree in the distinction between firms and markets.

the principal's problem is to determine the extent to which the firm's good performance, say, is attributable to the diligence of the agent and to which extent it is the result of random factors external to the firm, that is, the state of the world. The key elements of the problem are asymmetric information and uncertainty. Arrow (1985, p. 37) observes that the agency problem acquires interest "only when there is uncertainty at some point and, in particular, when the information available to the two participants is unequal".

A simple model of the principal-agent problem can be set out as follows (see Vickers and Yarrow, 1988 and Holmstrom and Tirole, 1989). Suppose that a firm's output x is a function of the agent's effort, a and a random term, u where u represents the state of the world. Therefore, x = x(a, u). The principal can observe x, that is, output, but not the individual values of a or u. His problem is to design an incentive scheme which will induce the agent to attain the level of effort a. If he could observe u, there would be no problem since the optimum solution would then be to use the observed value to determine the agent's remuneration. The optimum incentive scheme depends on whether the agent is risk-neutral or risk-averse.[6] If he is risk-neutral, and is therefore indifferent to bearing all the risk, the agent pays the principal a flat amount (say profit) that is independent of the state of the world. This means that if the firm does rather well, the agent obtains extra remuneration, and if it does badly the agent's payoff will be lower than normal. On the other hand, if the agent is risk-averse, he will want to be insured against bad states of the world. The problem is to devise an incentive scheme that compensates him for hard work, otherwise he will not put in extra effort. Extensions of this model can be made to accommodate situations where the agent can observe the state of the world before entering into contracts with the principal. In the circumstance, he will use such information to his advantage (Holmstrom and Tirole, 1989). We will return to these aspects when we come to consider the constraints shareholders impose on management.

3.11 Comparative Efficiency: The Theoretical Debate

Studies of comparative efficiency have generally attempted to answer the question of whether public enterprises and private firms would, in efficiency terms, perform equally well given similar economic circumstances. In many such comparisons, the usual presumption is that ownership matters and that, therefore, private firms are more productively efficient than public enterprises (De Alessi, 1980). The theoretical argument advanced in support of this presumption is based mainly on the property rights hypothesis. As we have already seen, proponents of this hypothesis argue that a shift from the simple, owner-managed firm to the complex corporation brings about an attenuation of property rights. The owner-manager, given his direct claim to the firm's residual has a strong incentive to pursue the objectives of the firm. In the public liability company,

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6   In this version it is assumed that the agent cannot observe u before contracting with the principal.

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however, managers will have much scope for pursuing their own ends or what is referred to as discretionary behaviour (Williamson, 1964). Zeckhauser and Horn (1989) argue that the constraints that help align the interests of shareholders with those of management in the privately owned corporation are weaker or non-existent in the public enterprise. We are going to subject these arguments to further scrutiny by examining a number of external and internal constraints that are likely to influence, in different ways, the behaviour of public enterprises and private firms.

3.11.1 External Constraints

The external constraints we shall examine are those brought to bear by shareholders, the capital market, the managerial labour market, the product market and banks. In each case we are going to contrast the likely effect on the private firm with that on the public enterprise.

3.11.1.1 Shareholders

In the private firm it may be assumed that the rational shareholder will be interested in monitoring the activities of management in order to "limit management behaviour which diminishes owners' utility" (Millward and Parker, 1983 p.215). In principle he could do this by collecting information on the performance of management and, acting in concert with other shareholders, introducing the changes considered necessary, be they in terms of replacing management or changing company policies. The shareholder could conceivably monitor management up to the point where the marginal costs and marginal benefits of such monitoring are equal (Waterson, 1988). Unless he owns substantial shares, however, the shareholder is likely to question why he should incur substantial monitoring costs given that whatever beneficial changes might result from his actions will benefit all shareholders. In other words he will be confronted with the free-rider problem. It is, therefore, argued that the resources devoted to monitoring management will be suboptimal and managers will have the discretion to pursue their own objectives. Fama (1980) discounts the monitoring role of shareholders, pointing out that they are unlikely to be interested in the detailed activities of any one firm. This is so because risk minimization compels them to diversify their investment portfolio across many firms.

The public enterprise, unlike the private firm, is considered not to have a well defined principal (Aharoni, 1982). Nonetheless, there is some correspondence in the principal-agent relationships. In regard to private firms, the shareholder acts as the principal and the board of directors as agent. In turn, the board acts as the principal and the management as agent. In publicly owned firms, on the other hand, the chain of principal-agent relationships is as follows: voters as the principal and government as the agent; government as the principal and the board of

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directors as the agent; board as the principal and management as the agent. Since ownership of the public enterprise is vested in the public at large monitoring costs to a member of the public, as in the case of a shareholder, are likely to be heavily outweighed by benefits (Millward and Parker, 1983). Further, unlike shareholders, who by selling their shares can sever relationships with a given firm, members of the public cannot terminate their ownership rights in public enterprises. The signal provided by falling share prices in private firms is, therefore, lacking.

It could equally well be assumed, however, that the principal is a government department, such as the Treasury, with the power to impose a strict regime of control. We return to this subject in a subsequent section. Vickers and Yarrow (1988) are in fact of the view that collection of monitoring information could be a natural monopoly, in which case allocative efficiency requires that this function be undertaken by one agency. Even so, they acknowledge that competition among shareholders, acting as independent monitors, is likely to yield more relevant information; and this could lead to a superior monitoring regime. It is therefore not possible to determine, *a priori*, whether monitoring by private shareholders is superior to monitoring by government departments.

3.11.1.2 Capital Market

Should the performance of the private liability company decline, the price of its shares will fall and this will impair the firm's ability to raise funds in the capital market. Moreover, it is argued that the divergence between the potential value of such a firm and its actual value will make it attractive to potential raiders and that the effect of this threat is to impel management towards greater efficiency. This process, however, is not straightforward (Holmstrom and Tirole, 1989). It is pointed out, for instance, that when a takeover becomes imminent, the price of shares is bound to rise. This comes about because current management, claiming to have superior information, endeavours to assure shareholders that the performance of the company will improve. If the management succeeds in its mission, future benefits will be anticipated by investors and capitalised into the share price. The higher price will, in turn, reduce the benefits of takeover. Vickers and Yarrow (1988), after a review of both theory and empirical evidence, conclude that the effect of takeover threats on management is ambiguous.

The threat of takeover is absent in public enterprises, as well as in closed shareholding companies.

3.11.1.3 Managerial Labour Market

Managers invest a substantial part of their human capital in the firms they work for and are rewarded for this via their emoluments. Williamson (1964) argues that in exercising managerial discretion, managers will   tend to overconsume perquisites. A different view is put forward by Fama (1980), who believes that overconsumption would be detected by the firm and the manager penalised by having his emoluments adjusted to take account of his overconsumption. In other words, there would be what Fama calls an *ex post* settling up. It is also asserted that the labour market uses the performance of a firm to determine each manager's opportunity wage; and, therefore, managers have an incentive not to pursue their goals but those of the firm. Fama in fact argues that the labour market for managers, both within[7] and outside the firm, is the primary disciplining factor.

The extent to which the labour market constrains managers in public enterprises depends on whether or not such managers can expect to move to private firms. For instance, Waterson (1988) believes that in the United Kingdom there is some movement of managers from public enterprises to private firms but the evidence is not strong.

3.11.1.4 Product Market

Where a competitive product market exists the presumption is that only efficient firms can survive. In contrast, where a firm has market power, as exemplified in the extreme case by the monopolist, inefficiency will not lead to exit. Waterson observes that since a competitive market is not synonymous with the perfect competition model of traditional theory, account should be taken of imperfect information and costly monitoring by shareholders. In other words, competition will not completely rule out inefficiency. Nevertheless, he adds, it is reasonable to suppose that the more efficient firms are likely to provide a policing function over their competitors. To this extent the product market will act as a constraint on inefficient firms.

Public enterprises, on the other hand, are quite often insulated from competition. Even where no such protection is provided, it is unlikely that they will perform better given that the penalty of bankruptcy does not apply.

3.11.1.5 Banks

Given their concern about loan security, banks will monitor public liability companies to which they have made loans. The interest taken by a bank in the operations of a particular

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[7]   It is assumed that within the firm, lower-level managers act as potential competitors to top management.

company, however, will not go beyond ensuring that performance is good enough to assure loan repayment. Put differently, the bank's constraint will not necessarily ensure efficiency.

Bank loans to public enterprises, on the other hand, are usually guaranteed by the state. Since such guarantees are virtually free of risk, it is likely that in this instance, banks do not play a significant monitoring role.

3.11.2 Incentives and Constraints within the Firm

Besides external constraints, internal constraints influence the behaviour of management. Here, we shall consider the effect of managerial emoluments on the behaviour of management.

Shareholders attempting to constrain the manager via his emoluments face two basic principal-agent problems commonly referred to as moral hazard and adverse selection (Waterson, 1988). Moral hazard, which is also referred to as hidden action, applies to the situation where the principal cannot observe the action of the agent, as discussed in the principal-agent model we set out earlier.[8] The principal will want to put the agent on an incentive scheme that makes him pursue the principal's interests. This is usually accomplished by means of a salary and share options. In effect, this means that some of the risk is passed on to the agent since under such a regime the level of his benefits will depend partly on the firm's performance. This type of incentive scheme will probably impel the manager towards greater efficiency. Passing on some risk to the manager also guards against the problem of what is referred to as adverse selection.[9] Here, the manager has information that he can use to his advantage in his dealings with the principal. On the other hand, an incentive scheme that makes him assume some of the risk deters the manager from taking undue advantage of the information at his disposal.

In public enterprises, it is common for managers to receive flat payments. This is consistent with the argument that the government, the principal, is risk-neutral given its highly diversified portfolio. It may be the case, therefore, that since their emoluments are not related to performance, public enterprise managers will not put in extra effort.

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[8] The term is borrowed from the insurance industry. In illustration, the case is usually given of the party whose property is insured but who does not take the precautions necessary to prevent fire. Should the property be destroyed by fire, the insurance company pays out since it cannot establish what action the insured party had taken before the fire.

[9] This term is borrowed from health insurance. The argument is that unhealthy people are on balance more likely to seek health insurance. As the insurer is unlikely to obtain all pertinent information from his clients, he is not able to charge insurance premia that correspond to the risk insured. He is then said to confront the problem of adverse selection.

3.12 Relevance of Recent Managerial Theories to LDCs

Recent managerial theories appear relevant to a study of business enterprises in LDCs but there are two assumptions that require qualification. First, capital markets in LDCs are not well-developed (Cook and Kirkpatrick, 1988; Heald 1990). This means that shares are not easily transferable and, therefore, the potential threat of takeovers is likely to be absent, contrary to one of the assumptions of recent managerial theories. On the other hand, it may mean that shareholders monitor management performance more vigorously than would otherwise be the case, given the difficulty of share transfer. At the limit, shareholders would also be managers behaving like the owner-managers of the classical firm modelled by Alchian and Demsetz (1972). Second, the labour market for managers which Fama (1980) believes to be an important disciplining force may be a relatively weak constraint on public enterprise managers in LDCs. In this regard, we saw earlier that the impact of the labour market depends on the extent to which managers are able to move from public enterprises to the private sector. The degree to which this movement occurs in LDCs is likely to be lower given that public enterprise managers may not qualify for private appointments. This is so because they are usually appointed via the political process without, in many cases, adequate regard for ability (Sandbrook, 1988). In Kenya, an official report has noted that political considerations occasionally override merit in the appointment of public enterprise managers (RoK, 1982). To that extent, the labour market may not constrain managers in publicly owned firms.

Given that the theoretical debate on comparative efficiency is inconclusive, it is not surprising that a number of analysts emphasise that whether or not private firms are superior to public firms is an empirical question that requires a case-specific approach (Millward and Parker, 1983; Vickers and Yarrow, 1988; Collins, 1989).

3.13 Direct Controls

We said earlier that a government department such as the Treasury could impose a regime of control on a public enterprise. Such a regime is meant to be a proxy for market controls where these are not expected to constrain the public enterprise. The performance of a publicly owned firm could therefore be evaluated directly against controls and yardsticks set by the government. These have been studied by a number of commentators, especially in the context of nationalised industries in the United Kingdom (see Heald, 1980; Webb, 1980; Redwood and Hatch, 1982; Henley et al. 1986, Harrison, 1988 and Waterson, 1988). The first set of controls has to do with pricing, investment and financial targets, the second is comprised of external financing limits, and the third consists of value for money audits.

Pricing controls try to ensure allocative efficiency and, towards this end, they usually require that price be equated to the marginal cost of production. In ideal conditions, the price should be equal to the long-run marginal cost but where capacity constraints exist, the tendency is to set prices to equal short-run marginal costs. Our evaluation of the allocative efficiency of NHC prices and rents will be conducted within the context of both long-run and short-run marginal costs, and the government's objective of subsidising housing. The pricing rules outlined here, as we saw earlier, are modified in respect to declining cost industries since marginal cost pricing would, in this case, lead to financial deficits. Controls on investments set a target rate of return which then acts as a test discount rate for screening new projects. The purpose of this investment criterion is to ensure the efficient allocation of funds between the public and private sectors. The criterion is not easily applied to integrated networks because of the difficulty of assigning a rate of return to individual projects (see, for instance, Vickers and Yarrow, 1988). Housing projects, on the other hand, constitute discrete investments and are therefore free of this particular difficulty. In our case, as we pointed out in Chapter 2, the Treasury now requires a rate of return of at least 15 percent on new investments by public enterprises but a lower return is acceptable where such an outcome can be justified on social grounds. Governments could also impose a required rate of return on existing capital programmes. Financial targets usually control the annual return on net assets and are meant to influence the activities and profitability of a public enterprise. It has also been customary for firms to be required to break even in historic cost terms (Henley et al., 1986), although where social objectives are not paramount, a positive return is usually required. A financial target is not a very effective constraint where a firm has market power since the target can be met via higher prices. On the other hand, an enterprise such as the NHC, which faces a generally competitive output market, would not have the option of raising prices. This is the case, however, only if the NHC is made to transfer to beneficiaries, the subsidies implicit in government finance and land.

At the enterprise level, external financing limits (EFLs), serve to limit the indebtedness of the enterprise to the government. In terms of macroeconomic policy, EFLs allow the government to control public sector borrowing. The EFL for an enterprise is defined by fixing the difference between revenue and the sum of current and capital expenditure. A falling EFL, therefore, is likely to induce an enterprise to increase revenue and to reduce expenditure. In the context of this study, the Treasury does not control the NHC's expenditure by means of EFLs but directly by fixing the Corporation's capital expenditure via annual budgets. In other words, the Corporation's revenue is not taken into account, as it would be under a system of EFLs. The Treasury's expectation seems to be that given the social objectives associated with lower-income housing, the NHC can do no better than break even.

Finally, a public enterprise could be subjected to value for money audits which usually focus on the efficiency and effectiveness[10] of the enterprise. Such audits are necessary because in spite of meeting its pricing, investment and financial objectives, a public enterprise could still be inefficient. We have already investigated efficiency and it now remains to define effectiveness. This term defines the extent to which the output produced meets the objectives of an organisation (Tomkins, 1982; Jackson et al., 1988). To put it another way, effectiveness is concerned to establish how actual results relate to the intended results of projects and programmes and whether or not policy objectives and operational goals are met. In order to measure an organisation's effectiveness performance indicators are used to compare output with objectives. One problem commonly encountered in effectiveness audits is the construction of indicators that show the extent to which the ultimate objectives have been met. To give an example, if the objective is to raise the standard of living via better dwellings, it is not obvious that higher expenditures on housing lead to higher living standards. Besides an indicator based on expenditure, it would be necessary to establish the extent to which dwellings are affordable by those in need of better accommodation. Even so, performance indicators could be qualified in such a manner as would make them relevant to assessing effectiveness.

3.14 Summary

This chapter attempted to identify an analytic framework within which to evaluate the behaviour of a specific firm. To start with, we noted the disparate nature of the theories of the firm and, for this reason, it was necessary to adopt an eclectic analytic framework informed by two main theories. On the one hand, is the traditional theory of the firm which, in essence, addresses itself to the behaviour of firms in a market system and not to the operation of a specific firm. On the other hand, are managerial and behavioural models whose common theme is the study of real business organizations. We first reviewed the behaviour of the profit maximizing firm, especially in terms of its production and cost functions. We also defined productive and allocative efficiency within the context of private costs and benefits. Noting that public enterprises, unlike private firms, are established to accomplish wider social objectives, we explored the extent to which the objectives of these organizational types are likely to diverge. Second we examined the early managerial and behavioural theories. Managerial theories, unlike the traditional theory, employ maximands other than profit. These include sales revenue, rate of growth and a general utility function comprising salaries and perquisites. Behavioural theories, on the other hand, tended to empasize non-maximising behaviour and were non-predictive. Third, we turned to recent managerial theories. We noted that they appear to contain both managerial and behavioural attributes in that they assume maximising behaviour while at the same time stressing conflict

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[10] In the literature, reference is usually made to the so called "three E's" of efficiency, economy, and effectiveness (Jackson et al., 1988). There appears to be an overlap between efficiency, defined by Jackson et al. as output divided by resources consumed and, economy, which has to do with how input costs compare with planned or expected costs. Given this overlap, we have distinguished only the two categories of efficiency and effectiveness.

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between contracting parties. Of particular relevance to this study is the principal agent theory which places emphasis on the design of incentive schemes, especially in the context of asymmetric information and uncertainty. Fourth, we explored the comparative behaviour of private and public enterprises, and the relative effects of various external and internal incentives and constraints. In terms of efficiency, neither type of organizational form appeared superior. Finally, we turned our attention to direct controls that governments impose on public enterprises and which are meant to imitate the effect of markets on firm behaviour.

In setting out the analytic framework within which to study a specific organization, this chapter has paid attention to the different effects that various incentives and constraints are likely to have on public and private organizations. In particular, the chapter has highlighted the insights into firm behaviour given by the principal-agent and property rights theories. Testing procedures for assessing NHC behaviour, which are developed in the next chapter, will rely substantially on such insights.

4. RESEARCH METHOD

4.1 Introduction

In the previous chapter, we looked at various theories of the firm and their implications for the relative behaviour of private and public enterprises. In particular, the agency problem between owners and managers was highlighted. Further, attention was given to the external and internal incentives and constraints that are likely to influence private firms and public enterprises, usually in different ways. We also noted that for private firms, the underlying assumption is that the objective function is either profit maximization or one of various other maximands. The concern of public enterprises, on the other hand, is to attain social objectives.

The main purpose of this chapter is to devise a testing procedure for assessing the behaviour of the NHC within the context of the theories already examined. We start by amplifying the principal hypotheses given in the introductory chapter, as well as setting out the principal elements of our approach. Second, we discuss the methods that are commonly employed to measure relative productive efficiency and how such methods could be applied to the NHC. Third, we look at how allocative efficiency will be determined before turning to the question of how to assess equity. Fourth, we examine how an overall performance evaluation will be conducted, in order to establish the extent to which the Corporation meets its goals. Finally, we set out our approach to data collection and analysis. An evaluation of the data collected is also given.

4.2 Principal Hypotheses

Implicit in the theories of the firm reviewed in the previous chapter are five broad hypotheses that are relevant to this study. First, we saw that the separation of ownership from control, the divergence of the utility functions of owners and managers, and the presence of asymmetric information and uncertainty introduce an agency problem. The extent of this problem depends on the incentive scheme designed for the agent by the principal, as well as on the impact of various other external and internal incentives and constraints. The outcome of an agency problem between the NHC and the government is that the Corporation's actual goals would deviate from the formal goals set for it. This hypothesis could be tested by establishing the extent to which the NHC meets its formal objectives, and by assessing whether or not shortfalls in performance should be imputed to inadequate monitoring and control by the government. Second, the supposition that managers exercise managerial discretion via expense preference implies that such behaviour would be reflected in the rates of growth of salaries and perquisites. We also noted the argument that the attenuation of property rights is more pronounced in public enterprises than in private firms. Our

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third hypothesis, therefore, is that private developers are more efficient than the NHC. Fourth, we will test the hypothesis that NHC rents and prices are allocatively inefficient. To do so, such rents and prices will be compared with short-run and long-run marginal costs in the housing market. Finally, we shall test hypotheses relating to the vertical and horizontal equity of the subsidies that underlie housing financed by the Corporation. The main supposition will be that one of the government's distributional objectives in the housing sector, which has to do with the equitable distribution of subsidies, is not met. Consequently, one hypothesis is that subsidies to beneficiaries of NHC financed housing are regressive. The other is that households in different tenures are treated differently and subsidies are therefore not tenure-neutral. These are the main hypotheses that will be tested and, where necessary, other complementary hypotheses will also be investigated.

4.3 Main Approach

Our research method consists of two main approaches. The first is a direct evaluation of the NHC, assessing its performance in reference to its immediate objectives. The second is a comparative evaluation which looks at the performance of the NHC relative to other generally similar organizations such as private developers and financial institutions. In both respects, the analytical methods to be used employ qualitative and quantitative information. In particular, the quantitative methods applied will consist of inference based on statistical data, ratio analysis and simple statistical models.

At one level, the study evaluates the NHC in reference to its programmes countrywide. This is the case in so far as productive efficiency and performance evaluation are concerned. At another level, case studies of projects in Nairobi have been employed. This is the approach taken to investigate allocative efficiency and equity. Nairobi is made the focus of investigation because it accounts for a major part of the Corporation's housing programme.

Direct evaluation will mainly make use of performance indicators aimed at measuring the NHC's effectiveness, that is, how actual performance compares with the goals stated in various development plans or with those set internally by the Corporation itself. We saw in the previous chapter that this type of evaluation falls under the rubric of "value for money" audits.

In as far as comparative evaluation is concerned we should, ideally, assess the NHC in relation to organizations with similar social objectives but in which managerial discretion is absent. Then, after measuring such differences in performance as may exist, we would be able to attribute such differences to managerial discretion. This approach is, however, not possible as ideal organizations with which to make such comparisons do not exist. Instead, we shall make the

following types of comparison. In regard to economic efficiency, we are going to examine both productive and allocative efficiency. On the one hand, productive efficiency will be evaluated by comparing one group of NHC projects with another, as well as with private sector projects. Care will be taken to ensure that, as much as possible, comparisons are restricted to projects with similar features. On the other hand, allocative efficiency will focus on the extent to which NHC housing rents and prices, and rates of return deviate from both short-run and long-run costs in the housing market, taking account of subsidy.

Our investigation of equity will use the rental housing stock of the Nairobi City Commission (NCC) as a case study. NCC's housing has largely been financed by the NHC and although it is managed by the NCC, its rent structure reflects government policy. We shall establish the degree to which such housing is subsidised and the likely implications for equity of the underlying subsidies.

We now turn to a more detailed account of our approach, as well as the hypotheses to be tested.

4.4 Productive Efficiency

We saw in Chapter 3 that for productive efficiency to be achieved two requirements must be met. The first is that for a defined output, the least quantity of factors of production should be used. This is what is referred to as technical efficiency. The second is that given relative factor prices, inputs must be combined in such a way as to yield the least cost for a particular output. In assessing relative productive efficiency between firms it is important to ensure that like is being compared with like. For this reason, it is necessary to hold a number of variables constant. These mainly comprise the level of output, factor prices and product dimensions (Tyler, 1979). Only if these aspects are held constant is it possible to determine whether or not costs are sensitive to ownership type (Millward and Parker, 1983).

The level of output is important because where there are increasing returns to scale, technical efficiency will increase with firm size, and conversely will decrease with size where decreasing returns occur. Returns to scale, therefore, make it necessary to correct for firm size. Public firms may be large because they are required to meet objectives other than those of economic efficiency. An example is the appointment of more staff than are required because the government wishes to contain unemployment. Unless a correction for size is made, therefore, efficiency comparisons between large public firms, say, and small private firms will partly reflect efficiency differences brought about by varying levels of output. If higher costs are attributable to the achievement of wider social objectives, however, such costs cannot be imputed to inefficiency.

Where firms face different factor prices that they cannot alter, they may be expected to choose dissimilar, but nevertheless efficient, production techniques. For example, a firm that is confronted by a higher price for a unit of labour, while other input prices remain unchanged, is likely to use relatively more of the factor inputs whose prices have not changed. Nonetheless, given the higher price of labour, the firm would incur a higher cost for the same output unless there was full substitutability of factor inputs. If this aspect is not controlled for, therefore, apparent differences in cost efficiency would not necessarily reflect ownership differences but rather the optimal choices dictated by relative input prices. On the other hand, higher costs may arise from higher input prices that are endogenous to a public enterprise. Here, the outcome is inefficient in that the higher prices imply the enterprise has not bargained as effectively as private firms.

Product dimensions need to be standardised in order to ensure that like is being compared with like. Where products are heterogeneous, differences in attributes should be allowed for in comparing one product with another. A comparison between NHC production costs and those of private developers should therefore take this principle into account.

We now turn to testing procedures. First, we explore the various methods that are used to measure relative productive efficiency. Second, we look at studies in which some of these methods have been used. Finally, we discuss the method employed in this study.

4.4.1 Measurement Methods

Two main approaches to measuring efficiency can be distinguished. The first uses measures of technical efficiency thereby disregarding the extent to which a firm takes relative factor prices into account in the production process. The second method is that of cost effectiveness. This method addresses itself to the combined effects of technical efficiency and "factor price" efficiency.

4.4.1.1 Technical Efficiency

Two principal methods are used to measure the technical efficiency of an enterprise. These are the frontier and non-frontier methods, examples of which can be found in Tyler (1979) and Barrow and Wagstaff (1989). In principle, the frontier method attempts to identify the production function, whose estimation then allows comparisons to be made between maximum output and actual output. In practice, the frontier is determined by firms that employ best-practice techniques in production and which can, therefore, be used as reference points in assessing the efficiency of other firms. Efficient organisations are said to operate on the production frontier whilst those that are inefficient operate within it.

Non-frontier methods, on the other hand, compare the technical efficiency of a given firm with "average" performance in the respective industry. Average performance is normally determined by means of a multiple regression model. If, for purposes of illustration, we took the simple case of a one input production process and regressed output on input, firms lying on the regression line would be of average efficiency. Firms below the regression line would be of below average efficiency and those above the regression line of above average efficiency.

Barrow and Wagstaff go on to argue that a different and more important distinction is whether a measurement method is statistical or non-statistical. Statistical methods make assumptions about the population distribution of the data while non-statistical methods do not. Yet a further division is between parametric and non-parametric methods. While parametric methods make assumptions about the nature of the underlying production function, non-parametric methods do not. Statistical methods tend to be parametric and non-statistical methods non-parametric. The use of the non-parametric approach was pioneered by Farrel(1957). Since the method does not require that a production function be specified, the bias that would result from an incorrectly specified function is avoided. However, as the production frontier is estimated using only extreme observations on output, erroneous observations are likely to have a large impact, an undesirable feature.

The main disadvantage of using technical efficiency in comparative studies is that the structure of factor prices is disregarded. In this study we have data on costs but not on the physical inputs and outputs required to assess technical efficiency. Our approach, therefore, does not investigate this subject further.

4.4.1.2 Cost Effectiveness

Since the measurement of technical efficiency does not take input prices into account it cannot, on its own, be used to investigate productive efficiency. Instead, the cost effectiveness approach is employed. This method measures productive efficiency by means of either cost functions or unit costs (Millward, 1988).

We saw in Chapter 3 that a cost function shows the minimum cost of attaining a specified level of output or alternatively, the maximum output that can be obtained from a given outlay. For the one input, one product case the total costs C can be expressed as:

$$C = f(Q, w, T)$$

where Q represents output, w is the input price and T is a shift or institutional dummy that measures the effect on costs of moving from one ownership type to another. In empirical work a

log form of the above function is usually estimated. Thus,

$$\ln C = A + a_1 \ln Q + a_2 \ln w + a_3 T + e,$$

where A is a constant, a_1, a_2, and a_3 are coefficients to be estimated and e is a random error.

Cost functions yield results that reflect the combined effects of technical efficiency and the extent to which factor inputs are used in the right proportions given their relative prices.

Productive efficiency can also be measured by means of unit costs. In other words, production cost is expressed in terms of a single dimension. This method is especially prevalent in the case of LDCs where data to estimate cost functions are not usually available. As Millward (1988, p.154) observes, "studies of costs in firms in LDCs have not used this cost function approach but have simply calculated costs per unit of output in public firms and compared these with costs per unit of output in private firms in the same industry".[1] Here too, adjustments for differences in factor prices, scale of output and product dimensions should be made in order improve the validity of comparisons of one firm with another.

4.4.2 Review of Methods Used in Efficiency Studies

We start with examples from industrial countries before turning to LDCs. Several reviews have looked at existing comparative studies (De Alessi, 1980; Borcherding et al. 1982; Millward and Parker, 1983; Millward, 1988; Vickers and Yarrow, 1988; Waterson, 1988; Boardman and Vining, 1989). Of these, only Millward and Parker (1983) and Millward (1988) have examined the methods used in some detail.

In general, the lack of suitable data has meant that there is considerable diversity in the methods used to determine relative efficiency. For instance, the performance indicators that have been employed embrace profitability, factor productivity and unit costs. In addition, many of the studies that examine specific sectors have not been systematic nor have their findings been given a uniform interpretation (Millward and Parker, 1983). Nonetheless, the attempts made to measure costs, to deal with economies of scale and to define and measure output should be of relevance to this study.

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[1] This is akin to applying the principles of yardstick competition. To give an example, where cost data are not available on two regulated firms A and B that provide the same service and face similar cost and demand conditions, the price A is allowed to charge could be based on B's costs and vice versa. Each firm would then be allowed to retain the residual, given by the difference between cost and price. Disregarding collusion, this scheme induces both firms to reduce costs in order to maximize the residual (see Vickers and Yarrow, 1988).

To highlight the measurement methods used we will look at the three sectors that appear to have been studied more extensively than others. These are electricity, water, and refuse collection. Our main interest here is in the research methods deployed and their implications for this study.

4.4.2.1 Electricity

The existing cost efficiency studies suffer from a number of shortcomings. Perhaps the most serious problem, arising from the unavailability of data, is that some important costs have been disregarded. Further, the studies do not always take account of scale economies, differences in input prices and dissimilar output characteristics. Millward and Parker (1983) have reviewed the more important of these studies and their main observations will be reported here.

A study by Yunker (1975) that set out to test the property rights hypothesis via comparisons of unit costs achieved by public and private firms was deficient in three respects. First, it did not take account of input prices. This introduced a bias in that the effect of lower prices in the public sector, say, would be to suppress production inefficiencies. Second, no account was taken of the fact that some firms were engaged solely in distribution whilst others combined the main functions of electricity generation, transmission and distribution. Consequently, like was not being compared with like. Third, only operating costs were taken into account. Yunker, however, did attempt to control for scale economies by limiting his study to firms of comparable size.

In another study (Meyer, 1975), data on input prices were also lacking. However, Meyer assumed that these prices varied by region. An indirect attempt to control for this aspect was made by means of partitioning the data on a regional basis. To avoid the difficulty posed by different output characteristics, Meyer used cost data on firms that were engaged in all the three functions of generation, transmission and distribution. His samples of private and public firms, however, did not have a matching size composition. As in Yunker's study, only operating costs were considered, in this case covering labour, fuel and raw materials. Given these difficulties, Meyer's finding that costs were lower in public firms is open to challenge.

A third study by Neuberg (1977) controlled for various dimensions of electricity transmission and distribution, as well as for the cost of capital. Costs of generation were not taken into account. Neuberg's results suggested that costs were lower in public firms.

Finally, a study by Pescatrice and Trapani (1980) pointed to lower costs in the public sector. Although they controlled for the cost of capital, these analysts used cross-sectional data. This meant that if public firms had hitherto faced lower costs of capital, they might have acquired technology that allowed them to achieve lower current operating costs than private firms. The cost

superiority of public firms was therefore likely to be overstated.

4.4.2.2 Water Industry

Millward and Parker (1983) have reviewed in some detail two studies by Crain and Zardkoohi (1978, 1980). These studies used cost data that embraced operation, maintenance, administration and depreciation. It was established that the water industry is subject to increasing returns to scale. For this reason, public firms larger than the biggest private firm were excluded, thus avoiding the potential bias in the measurement of cost efficiency that scale economies would introduce. Multiple regression analysis was used to estimate unit costs as a function of the wage rate, the price of capital and output. An ownership dummy variable was also included. For firms of similar size, the results showed that private firms achieved lower costs.

Unlike the studies of electricity, the work by Crain and Zardkoohi appears to have taken all costs into account.

4.4.2.3 Refuse Collection

The main difficulty of comparing the cost efficiency of firms engaged in refuse collection is brought about by the complex dimensions of this service. These dimensions are frequency of service, customer density, location of pick-up points, weight and type of garbage, climatic factors, topographic variations, and distance from the disposal site. Where public firms have achieved lower costs than private firms, this has been the result of area monopoly for a given type of garbage, hence scale economies from contiguity of customers (Millward and Parker, 1983).

Domberger et al. (1986) in a study of refuse collection in British local authorities used multiple regression analysis to control for the various dimensions. They assumed in their analysis that the underlying production function exhibited constant returns to scale; and that the independent variables in the cost function did not interact. Their cost figures took account of both direct and indirect costs.

Taken together, the studies illustrate the various methods employed to measure costs and to control for differences in firm size and output. In particular, multiple regression analysis has been widely used to control for differences in product dimensions, as well as for ownership type. There appear to have been three key deficiencies, arising from unavailability of suitable data. The first is the difficulty of measuring costs and, in the electricity sector in particular, only operating costs were considered. The second is the problem posed by comparisons between firms of varying size. The third problem has to do with comparisons between firms whose output is different. In this

study, it will be important to ensure that comparable difficulties are given attention.

4.4.2.4 LDC Studies

A number of relative efficiency studies have been carried out in LDCs, mainly on the manufacturing sector. According to Millward (1988) the studies that find in favour of the private sector have a number of flaws. First, public firms tend to be larger than private firms. As a result, where there are decreasing returns to scale, the productive efficiency of public firms will appear to be lower than that of private firms. In other cases, for instance Kim's (1981) study of manufacturing industries in Tanzania, output is measured in terms of cost and profits. For this reason, efficiency measurement tends to reflect prices and profitability. Second, corrections have not always been made for differences in factor prices between public and private firms, as well as for differences in output characteristics. This is the case for Kim's Tanzanian study and other studies of the manufacturing industry in Indonesia by Funkhouser and MacAvoy (1979) and Hill (1982). Third, there are cases where in the measurement of technical efficiency the value of output has been used as a proxy for the volume of output. This has meant that the technical efficiency measured has reflected the underlying price distortions.

In spite of their focus on the manufacturing sector, LDC efficiency studies seem to suffer from similar measurement problems as do studies elsewhere. These problems mainly have to do with the failure to make corrections for economies of scale, differences in factor prices and dissimilar output dimensions. The inability to surmount these difficulties has, in some cases, tended to introduce a bias against public firms, thereby leading to erroneous conclusions on relative efficiency. This analysis has some implications for our study. First, in order to ensure product comparability, it will be necessary to disregard site and service projects since private developers do not provide this type of housing. In any case, as we saw in Chapter 2, the NHC has for a number of years now excluded such projects from its programmes. Second, where practicable, corrections will be made for differences in dwelling types and project size

4.5 Measuring NHC's Productive Efficiency

We will use two methods to assess the productive efficiency of the NHC relative to private developers. First, we are going to make unit cost comparisons based on the development cost per square metre of the floor area of a dwelling. Second, as the unavailability of data on input prices does not allow a "true" cost function to be estimated, we will employ a hedonic costs approach in order to cross-check the consistency of the results of our first method. Accordingly, we shall estimate a multiple regression equation in which the cost per square metre is expressed as a function of dwelling type, location, floor area and the construction time. By regressing unit cost

on these variables, it will be possible to determine their respective impacts. The justification for using the cost per square metre as a measure of productive efficiency is that the objective function set for the NHC by the Government could be construed to be the minimisation of development costs. In this regard, it may be hypothesized that managerial discretion by the NHC does not allow the pursuit of such an objective. As a result, private developers operating in a competitive environment would achieve lower unit costs. This is the hypothesis that will be tested.

Comparisons will be based on total development cost, excluding the cost of land. In other words we are going to use the sum of the direct variable input costs of development and indirect costs.[2] The cost of land has been excluded because the data provided by both the NHC and private developers do not include project-specific values of land.

Our costs also disregard future maintenance costs. Clearly, if the NHC, relative to private developers, builds lower specification dwellings which require a higher level of maintenance, any efficiency comparison based on development costs would be biased in the Corporation's favour. There is no evidence to suggest that the NHC follows a low specification-high maintenance strategy. We shall, therefore, assume that NHC and private dwellings alike incur equivalent maintenance expenditures.

The development cost we use is an aggregate of the following cost items.

(a) Contractor's costs of labour, depreciation of plant and equipment, building materials and overheads.

(b) Developer's costs in respect to professional fees for design and supervision; interest on construction finance; and overhead costs.

Our analysis will proceed as follows. First, we shall establish the NHC's development cost per square metre of floor area for projects completed recently. Similarly, we shall work out the equivalent costs for private developers' projects. These unit costs will then be expressed in 1989 prices.

An ideal setting for comparison is one where product dimensions, scale of output, and factor prices are similar for the NHC and private developers. In practice, such an ideal setting does not exist, making it necessary for a number of adjustments to be made before costs can be compared. The adjustments required are discussed below.

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[2]   We estimate from NHC accounts that indirect costs, taken to comprise salaries of non-project related staff, general administration expenses, and maintenance and depreciation of fixed assets, make up about 10 percent of NHC project costs.

4.5.1 Product Dimensions

In general, the dwellings developed by the NHC are usually in lower-income and middle-income areas. Private developers, on the other hand, tend to build larger dwellings in middle- and higher-income areas. Admittedly, these generalizations conceal similarities between dwellings developed by both the Corporation and private developers. For instance, the typical middle income dwelling developed by either organization is a terraced maisonette of about 100 square metres of floor area. Differences in size may in any case not have much of an impact, as the cost per unit area is to a large extent independent of floor area.[3] Differences in product dimensions will be controlled for as follows. Where comparisons are based on unit costs, such comparisons will be restricted to dwellings with comparable attributes. The second means of control will be via the hedonic costs approach already referred to.

4.5.2 Scale Economies

Where some statistical evidence exists on economies of scale, it seems to be project-specific, with little direct connection to whatever economies may exist at the level of the firm. In housebuilding contracts in the United Kingdom, for instance, it is argued that "returns increase with scale from the smallest (contracts) to those slightly larger and there is clear evidence of decreasing returns over the middle range of contract size" (Stone, 1983 p.150). We therefore have no direct evidence that efficiency varies with firm size. In Kenya, of some 593 property companies enumerated in 1986,[4] about 90 percent did not have more than 4 employees, and only 4 employed a number greater than 50. The NHC, in contrast, has more than 400 employees. It could be argued, therefore, that given the substantial difference in firm size, optimal input mixes for the NHC and private developers are likely to be different. However, since the main production activities by both the NHC and private developers are undertaken via contractors, it is perhaps more relevant to make efficiency comparisons at the project level rather than at the level of the firm. We will therefore include a variable on project size in the hedonic costs equation in order to investigate whether or not economies of scale exist. As NHC projects are usually larger than projects by private developers, economies of scale would imply lower costs for the Corporation, and higher costs if there are diseconomies.

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[3] The cost per square metre nevertheless should fall with dwelling size. This is because, within limits, the fixed costs of small and large dwellings are more or less equal. These costs ordinarily comprise the expenses of installing kitchen and sanitary facilities. As the marginal cost falls, so does the total average cost.

[4] See Statistical Abstract, 1988, p. 86.

In Chapter 2 we saw that the NHC and private developers face different prices for finance and land. In spite of the low interest rate at which it borrows, the NHC now assigns higher financial charges to projects under construction. Nonetheless, such charges are still lower than those charged by private developers whose financial costs reflect market conditions.[5] It will be necessary, therefore, to adjust the Corporation's development costs in order to ensure comparability. With regard to land we pointed out that the NHC does not pay a stand premium before taking possession of land, nor does it pay ground rent during the development period. Relative to those private developers who buy land at market prices the NHC has a financial advantage equivalent to the interest developers forego on their outlay on land. An adjustment to take account of this financial advantage will therefore be investigated.

4.6 Allocative Efficiency

We will assess the allocative efficiency of the NHC using two complementary methods. The first will examine the extent to which NHC housing prices and rents deviate from the long run marginal cost (LRMC) of housing provision. The second will look at the divergence between the actual rates of return and the long run equilibrium rate of return.

Where a competitive market exists and externalities are absent, the market price may be taken to be a good approximation of the LRMC.[6] In the event, the divergence between the price charged by the NHC and the LRMC would establish the degree of allocative inefficiency, but only so long as the underlying subsidy is not socially justified. To simplify our analysis, we are going to start with the assumption that market prices and rents in the Nairobi housing market reflect the LRMC of housing provision. This assumption will be relaxed later in order to explore the situation where the housing market is in disequilibrium, with market rents and prices reflecting short-run marginal costs.

In order to determine whether or not there is a divergence between the prices and rents charged by the NHC and their market equivalents, we shall first predict market prices and rents for NHC housing by means of multiple regression analysis. The regression equation to be employed will have as its dependent variable the market rent or price of a dwelling, and dwelling characteristics as the explanatory variables. Two equations will be estimated using, respectively, price and rent cross-sectional data for 1989. The results will be used to predict market prices and

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[5] We saw in Chapter 2 that the NHC generally borrows at an interest rate of 6 percent per year. Its financial charges during construction are now usually based on an interest rate of 13 percent per year. On the other hand, private developers base their charges on at least 19 percent.

[6] The LRMC is taken, by definition, to be based on the cost efficient marginal cost.

rents for NHC dwellings. A comparison of predicted market prices with actual prices, and of predicted market rents with actual rents will yield estimates of subsidy. Unless they are socially justified, such subsidies will be considered to reflect allocative inefficiency.

A comparable procedure will be followed in calculating rates of return. The fitted regression equation for sold dwellings will be used to predict capital values of NHC rental housing. Conversely, the regression equation for rented dwellings will be used to establish the imputed market rent for dwellings sold by the NHC. This procedure will allow actual rates of return to be compared with market rates of return.

This method assumes that the price or rent for a dwelling can be determined by aggregating the unobserved expenditures on the attributes of a dwelling. These attribute expenditures are also referred to as implicit or hedonic prices. The attributes comprise both dwelling-specific features such as size, number of rooms, structural quality and plot size, and neighbourhood characteristics such as the quality of other houses in the vicinity. Location is also an important attribute, particularly in terms of access to places of work and the implied transport costs. The relationship between rent (or equivalently price) and the attributes of a dwelling is usually expressed in the form of a multiple regression equation which is then estimated using the ordinary least squares method. Thus,

$$P = B_0 + B_1 X_1 + B_2 X_2 + \ldots + B_n X_n + e,$$

where P is the response variable representing rent (or price), B_0 is the intercept, B_1 to B_n are the coefficients to be estimated, X_1 to X_n are the explanatory variables representing dwelling attributes, and e is an error term. Each of the coefficients measures the change in the response variable brought about by a change in an explanatory variable, holding all other explanatory variables constant.

Ball (1973), Maclennan (1977), Robinson (1979) and Mark and Goldberg (1988) discuss a number of problems concerning the use of this method in estimating market prices. The first concerns the functional form of the equation. It is argued that the additive form of the regressors may not be an appropriate representation of the way they combine to yield the market rent; and that a multiplicative aspect should be introduced. This can be achieved by introducing log linear forms (Maclennan, 1977; Coulson & Robins, 1987). The second problem concerns multicollinearity between the explanatory variables. This arises because many of the attributes tend to be found together in similar dwellings, making it difficult to establish their independent contributions to changes in the response variable. This problem is usually addressed by examining the correlation matrix of the explanatory variables and omitting those that are highly correlated

with others. In any case, where the main aim is to predict and not to determine the values of the respective attribute prices, the method discussed here is considered legitimate (Maclennan, 1977).

The third problem is that of market imperfections as a result of which the same attribute may have varying prices in different submarkets. For instance, on account of the segmentation of the housing market, Maclennan (1977 p. 63) argues that "the assumption of a unitary equilibrium housing market therefore limits the utility of house price studies". This difficulty could be contained to some extent by restricting comparisons to dwellings in comparable locations.

4.7 Equity

One of the important social objectives of public enterprises is to modify the distribution of income through pricing and allocation. To gain insight into this aspect within the context of the NHC, we are going to investigate the distribution of subsidies in programmes financed by the Corporation. Evidence referred to in Chapter 2 showed that public housing in the country is not allocated on a systematic basis, suggesting that incomes of potential tenants are not taken fully into account. The distributional impact of this practice is likely to be adverse and, consequently, our hypothesis is that subsidies in the housing programmes financed by the NHC are not distributed equitably. To test this hypothesis, we will make a distinction between vertical equity and horizontal equity. Vertical equity is concerned with the distribution of subsidies among households with different incomes within the same tenure. Horizontal equity has to do with the distribution of subsidies between tenures for households having comparable incomes.

To establish whether or not subsidies are equitably distributed, we are going to use the rental housing stock of the Nairobi City Commission (NCC) as a case study. This housing stock has been financed almost entirely by the NHC and in the terms of the Housing Act, "Any local authority may sell or let on such conditions as may be specified by the Corporation any dwellings constructed by it" (Housing Act, Section 11, Subsection b). This gives the NHC formal powers to determine the conditions upon which dwellings are let.[7] It could be argued, therefore, that in the area of rent policy, the NCC acts as an agent of the NHC and, ultimately, of the government.

In an ideal housing market, subsidies would be given by the difference between the equilibrium rent and the actual rent. In practice, however, it is customary to use the market rent instead of the equilibrium rent. To determine the amount of subsidies to NCC tenants, therefore, we are going to compare actual rents with estimated market rents. Market rents will be predicted using the hedonic price approach described in the previous section. Subsidies will be defined as the difference between market and actual rents. In order to investigate vertical equity, we will

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[7] In practice, this power is likely to be exercised more directly by the Ministry of Local Government.

examine the trend of the ratio of subsidy to income. If this ratio declines with income, our conclusion will be that there is vertical equity in the distribution of subsidies. To assess horizontal equity, we will compare subsidies to NCC tenants with subsidies to owner-occupiers who have equivalent incomes. It will suffice, for the moment, to define the formal subsidy to an owner-occupier as the unpaid tax on the imputed rent of his dwelling. A fuller exposition of this definition is given in Chapter 7 and in Mutero (1988).

Besides the question of the distribution of subsidies within and between tenures, is the related one of access to such subsidies. This question is particularly important in Nairobi because private tenants, who make up about 60 percent of the population, pay market rents. Moreover, a substantial proportion of this population is poor, living in temporary dwellings that account for at least one-third of the housing stock (RoK, 1986b).

4.8 Performance Evaluation

This section deals with the type of performance indicators that will be employed to establish how the NHC has performed relative to various goals, thus allowing an overall evaluation to be made. To put it another way, our aim is to determine the effectiveness and efficiency of the Corporation's management. We start, however, by examining the general attributes and interpretation of performance indicators. Jackson et al. (1988) list a number of qualities that performance indicators should ideally have. First, they should be related to the objectives of the organization. Second, they should be quantifiable and standardised in order to allow comparisons to be made within and between organizations. Third, they should be free from systematic bias. Care must, nevertheless, be exercised in the interpretation of performance indicators because they may not accurately reflect what they are supposed to measure (Henley, et al., 1986). An example that is commonly given is that the number of patients treated each day at a hospital is not necessarily a good indicator of the quality of health. An example more appropriate to this study concerns the overriding goal of the government to increase the production of housing affordable by lower-income groups. This could be viewed as an intermediate goal, with the ultimate objective being to raise living standards. As a result, a performance indicator based on the volume of dwelling production is a measure of the intermediate goal but not necessarily of the final goal. Nonetheless, it is sensible to use such an indicator because it is simple to measure and is likely to have a high degree of accuracy.

For purposes of exposition, we have set out in Table 4.1, the goals to be achieved and the relevant performance indicators.

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Table 4.1 NHC: Framework for Performance Evaluation

Goals	Performance Indicators
Reduction of shortage of dwellings in order to raise living standards.	- Number of dwellings produced relative to targets in development plan
Production of dwellings affordable to lower-income groups in order to raise their living standards and access to subsidies	- Cost per dwelling relative to development plan targets. - Ratio of average dwelling cost to median wage compared to ratio implicit in development plans.
Maximization of subsidy transfer subject to breakeven on basis of historic costs.	- Surplus or deficit in NHC's income and expenditure account - Relative productive efficiency
Management efficiency	- Project cost and time budgets compared to targets - Trend of operating costs relative to output - Arrears recovery ratios

The first goal has to do with the reduction of the shortage of dwellings in order to raise the standards of living. This goal is important because there is an acute shortage of dwellings in Kenyan towns. For instance, during the period 1976-1982, it is reported that the total number of urban dwellings produced was equal to only about 20 percent of additional urban households (RoK, 1989). The performance indicator that will be used here is the number of dwellings produced relative to targets in national development plans covering the period 1970-1988. The interpretation of this indicator can be ambiguous unless account is taken of the funds actually voted to the NHC. In other words, where the loans made to the Corporation are less than those projected in the development plans, declining output cannot necessarily be imputed to management ineffectiveness. On the other hand, there is some advantage to be derived from employing the indicator. Given that the NHC maintains reliable records of housing production and the targets in the various development plans are clearly stated, the indicator is likely to be reasonably accurate.

Besides looking at total housing production, it is also important to assess the extent to which the housing produced is affordable to lower-income households. Affordable housing may also be expected to improve the access of such households to the underlying subsidies. These are the

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aspects that the second goal is concerned with. The corresponding performance indicators are the cost per dwelling relative to development plan targets, and the ratio of average dwelling cost to the median wage. The latter indicator will also be compared with ratios implicit in development plans. Average cost is a relevant indicator because it has an important bearing on affordability and the number of dwellings that can be produced for a given financial outlay. The ratio of average cost to median wage is aimed at providing a better measure of affordability. Median wage, rather than median household income, has been used in the ratio because wage statistics are more readily available. The third goal is concerned with the transfer of subsidies to beneficiaries subject to achieving breakeven on the basis of historic costs. The goal attempts to ensure that, subject to a financial constraint, all the subsidies implicit in government finance and land are transferred to beneficiaries. The financial constraint, of its own, would not influence the Corporation's behaviour significantly given that there is much scope for raising the price of dwellings to cover costs. Where the NHC is productively inefficient some of the subsidy meant for transfer to beneficiaries becomes, in effect, part of the loan amount. In other words, the actual nominal price is higher than the cost efficient price. On the other hand, where the NHC is productively efficient, it may be assumed that subsidies are, in effect, transferred to beneficiaries. This discussion illustrates the need to link our analysis of subsidy transfer to the assessment of the Corporation's productive efficiency.

The last goal has to do with management efficiency. The performance indicators that will be used are the NHC's ability to meet planned cost and time budgets for projects, to contain operating costs and to recover outstanding arrears. It is hypothesised that management is inefficient if it fails, on a consistent basis, to meet its own project targets in terms of time and cost. Were the NHC a private concern with private goals to meet, project completion time would not be a straightforward measure of management efficiency. This is so because it would be necessary to interpret the indicator in reference to conditions in the housing market. If, for instance, there were a substantial decline in demand for housing, it would probably make sense to a private firm to delay the completion of ongoing projects. On the contrary, given the NHC's social objective of reducing the housing shortage, project delays are unlikely to be justified. In the circumstance, the ability to complete projects on time should be a reasonable indicator of management efficiency.

The rationale for using operating costs as a measure of management efficiency derives from the hypothesis by Williamson (1964) concerning expense preference by managers. In the terms of that hypothesis, if these costs grew significantly faster than output, say, it could be argued that they were a reflection of a significant level of managerial discretion and, therefore, of organizational slack. The same reasoning could be extended to the ability to contain arrears. In Chapter 2 we noted the Treasury's emphasis on prompt loan recovery. For this reason, growing

arrears could be imputed to management inefficiency. The data needed to measure the indicators of management efficiency discussed here are readily available.

4.9 Data

This section first discusses the data required for the study. Next it looks at data collection and analysis. Finally, an evaluation of the data collected is made and the underlying implications for the study highlighted. Aspects of data collection are discussed further in Appendix 1.

4.9.1 Data Requirements

To investigate the behaviour and performance of the NHC, we needed both general qualitative information and statistical data. General information was required on the NHC and its role in housing. Statistical data were needed on the main areas covered by the study, that is, productive efficiency, allocative efficiency, equity, and performance evaluation. Table 4.2 brings together the main types of statistical data required.

4.9.1.1 General Information on the NHC

General information on the NHC was required as a basis for establishing its immediate and wider social objectives, the control framework within which it operates and how it plans and implements projects. It was also necessary to know what the government's policies are in respect to efficiency and equity.

4.9.1.2 Statistical Data

Table 4.2 shows that two types of statistical information, time-series and cross-sectional data, were required. Time series data mainly comprised development plan targets, actual numbers of dwellings produced, median wage, balance sheet information, income and expenditure accounts, and arrears. Financial data on other public enterprises were also needed so that comparisons with the NHC could be made.

Cross-sectional data were required on construction times and costs,[8] on land values, on rents, prices and dwelling attributes, and on income distribution. Data on costs and dwelling attributes were needed for both NHC and private dwellings and were to be used to examine productive efficiency. Allocative efficiency and equity would be investigated using rent, price and dwelling

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[8] In practice, the cost data collected covered the period 1985-1989. Costs were then expressed in 1989 prices as described later.

attribute data for NHC, NCC and private dwellings. The data on income would allow an investigation to be made of the distribution of subsidies by income group for NCC tenants.

Table 4.2   Statistical Data Requirements

Study Area	Time-Series Data	Cross-Sectional Data
NHC	- housing production - dwelling costs - distribution of dwellings by tenure	
Productive Efficiency		- NHC and private development costs. - land values
Allocative Efficiency		- NHC and private prices, rents and dwelling attributes
Equity		- NCC* and private rents, and dwelling attributes - income distribution
Performance Evaluation	- development plan targets in terms of dwellings and costs per dwelling - median wage - NHC balance sheet information - NHC income and expenditure account - NHC capital budget - local authority loan arrears - arrears on NCC* estates - financial data on public enterprises	- project costs as tendered - actual project costs - construction time as per tender - actual construction time

* NCC = Nairobi City Commission

4.9.2 Data Collection

Data were collected from a number of sources. The main ones were the NHC, the Central Bureau of Statistics (CBS) and estate agents. Table 4.3 shows the sources by type of data and the area of the study to which the data relate. To supplement the table, we turn to an account of how data were collected from the main sources.

4.9.2.1 NHC

Besides general information, which is available in published reports, specific data were required on NHC projects, as well as on project planning and implementation aspects. These categories of data were obtained mainly from the Corporation's project files. Basically, the NHC maintains one set of files on technical and financial aspects of project implementation, and another relating to the allocation and sale of dwellings. We were given access to these files, from which we were able to extract cost data on 26 rental, tenant purchase and "mortgage" projects completed between 1985 and 1989.[9] The NHC records direct development cost data on two forms, one entitled "Cost Analysis as Tendered" and the other "Cost Analysis as Executed".[10] The first form sets out costs of development based on the winning tender, whilst the second contains the actual costs upon project completion. For each project, costs are divided broadly into building costs, land acquisition costs (if any), costs of infrastructure services, professional fees for design and supervision and interest on construction finance.

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[9] The total number of projects completed during this period is 28.
[10] Sometimes, the NHC also prepares a Cost Analysis as Estimated during the pre-contract stage.

Table 4.3 Sources of Statistical Data

Study Area	Time Series Data	Cross-Sectional Data
NHC	- NHC annual reports	
Productive Efficiency		- returns at the CBS* from private developers - cost analysis forms in NHC files - HFCK** records on private developers' costs - records at Dept. of Lands on government land sales
Allocative Efficiency		- questionnaire survey of estate agents - NHC records on rents, prices, and dwelling attributes
Equity		- NCC records on rents and dwelling attributes - 1983 survey data from the CBS
Performance Evaluation	- national development plans - statistical abstracts - NHC annual reports	- NHC project files - IDS*** working papers on the performance of various parastatals

* CBS	= Central Bureau of Statistics
** HFCK	= Housing Finance Company of Kenya
*** IDS	= Institute for Development Studies, University of Nairobi

From NHC files we also obtained the following information on project planning and implementation:

(a) Difficulties encountered during the pre-contract stage.

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(b)   Number of dwellings in each project, types of dwelling and floor area.

(c)   Tender procedures followed, i.e. either negotiated or competitive tendering.

(d)   Number of contractors invited to submit tenders.

(e)   Distribution of tender amounts.

(f)   Planned and actual construction times.

(g)   Implementation difficulties faced, e.g. late payments to contractors; abandonment of site by contractors; shortage of building materials.

(h)   Time taken to sell dwellings or hand over project to local authority.

A review of project related correspondence provided good insights into the difficulties encountered during project planning and implementation and how they were surmounted.

The NHC data were stored without any apparent order in about 100 files, making collation and cross-checking for accuracy a time-consuming exercise. While we collected most of the information we considered important, we could not obtain income data on households to whom dwellings had been sold. In some cases, too, the NHC had not worked out final project costs, and the data collected represent the latest estimates available in 1989.

4.9.2.2 Central Bureau of Statistics

Data obtained from the CBS comprised two categories. The first category consisted of development costs of private dwellings (excluding land); year of construction; dwelling area; dwelling location within Nairobi,[11] and dwelling type. The data collected were contained in a form designed by the CBS. In the terms of the Statistics (Buildings) Regulations of 1973, each developer must ensure that the form is completed. In turn, a local authority will not issue an occupation certificate until the form has been completed. Since a dwelling cannot be legally occupied unless an occupation certificate has been issued, it is unlikely that any developer will fail to complete the form. Where an architect is retained by the developer he will usually complete the form, otherwise this task is the direct responsibility of the developer. The form requires that upon completion of construction the developer should,

"Give the total expenditure directly connected with the construction of the building including plot services such as installation of electricity and water supply. But expenditure on such work as the building of an access road or railway track and laying of main services should not be included, nor should the cost of land."

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11   Either the street name or the name of the neighbourhood. This information allowed us to determine whether a
      dwelling was located in a lower-income or higher-income area; and, as a result, the respective values of the
      location dummy variable in the hedonic costs equation referred to earlier could be established.

Two statistical assistants at the CBS[12] transferred data from the original form to another prepared by the researcher aimed at capturing the data required for this study.[13] The data transferred to the new form were checked for accuracy, consistency and completeness. A common error was the use of the wrong unit, for example, area expressed in square feet instead of square metres. The data considered suspect were referred to the statistical assistants for cross-checking with the original records. Once corrected, the data were ready for coding and typing into the computer. In all, the data set contained information on about 500 projects.

The information held by the CBS appeared to be well-recorded and maintained but since it had not been processed, it required considerable cross-checking for accuracy. As the CBS does not ask developers to provide project-specific land values this type of information was not available.

The second category consisted of data from an urban housing survey conducted by the CBS in 1983. In Nairobi, the survey was based on a stratified sample of 1,300 residential buildings and about 1,100 households. Information collected consisted of socio-economic data such as household income, as well as data on dwelling attributes. A more detailed review of the data selected for use in this study is contained in the chapter on equity.

4.9.2.3 Estate Agents

Data on prices, rents and dwelling attributes were obtained by means of a short questionnaire to 25 estate agents. This number is considered to represent a substantial proportion of such firms in Nairobi.[14] It was considered important to use a short questionnaire for two reasons. First, such a questionnaire would not require too much time to complete and the respondents should as a result not be particularly averse to providing information. Second, respondents might, in any case, not have in easily retrievable form detailed data on dwellings they had either sold or leased.[15] In order to assure an acceptable degree of accuracy of the regression equation to be estimated, it was necessary to have data on a reasonably large number of dwellings. In general, it is important that there be as many degrees of freedom as possible, where these are defined by the difference between the sample size and the number of explanatory variables in the equation. Taking this general requirement into account and the time available for this part of our work, we decided to aim for information on about 100 dwellings sold in 1989 and on an equal number of rental

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12 These statistical assistants were familiar with the filing of building data at the CBS where they had worked for a number of years.

13 It is important to mention that the names of developers were considered confidential by the CBS, and were therefore not divulged to the researcher.

14 It is difficult to establish the exact number of these firms as some of them are not professionally registered. Advice on the well-established firms, which were likely to provide accurate information, was sought from a practising valuer.

15 As it turned out some firms did not have data on floor areas and plot sizes.

dwellings let during the same year. To allow for a sufficient margin of non-responses and incorrect information, each of the 25 firms was asked to provide data on 15 dwellings it had sold in 1989 and on an equal number of dwellings let during that year. Some diversity in the dwellings reported on was assured by asking firms not to select more than two similar dwellings from each residential neighbourhood.

The Ministry of Lands and Housing provided a covering letter to the questionnaires sent out, explaining the relevance of the study and requesting the respondents to provide information within one month. To ensure that prompt action was taken, we employed a land economics student from the University of Nairobi, who was asked to visit each firm and oversee the completion of the questionnaire.

In many instances, firms reported that the number of dwellings they had either sold or let in 1989 did not exceed 15. Their questionnaire returns, therefore, captured all the transactions they had handled. Completed questionnaires were returned by 20 firms, giving us consistent data on 102 sold dwellings and 105 rental dwellings. A copy of the questionnaire is at Appendix 2.

As the dwellings were not randomly selected, data received from any one firm may have been biased. For instance, a large, well-established firm is likely to deal only in expensive properties. The pooling of data from firms of different sizes, however, is likely to reduce such bias. Moreover, as many firms provided information on all the dwellings they had either sold or let, there was little intra-firm sampling bias.

4.9.3 Other Data Sources

Other data sources were the Housing Finance Company of Kenya (HFCK), the Nairobi City Commission and the Department of Lands. The HFCK provided data on some of the private projects it had financed in Nairobi in the recent past whilst the Nairobi City Commission made available data on dwelling attributes, rents and rent arrears. From the Department of Lands we received information on recent sales of government land in Nairobi, covering such aspects as the location of the respective parcels of land, plot size, capital value, stand premium and ground rent. This information was helpful in establishing the advantage, relative to private developers, that the NHC derives from free land.

4.9.4 Data Processing by Computer

Two sets of data required processing by computer. The first was the data set consisting of private rent and price information, as well as dwelling attributes. This set was to be employed in

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the estimation of multiple regression equations, one for rental dwellings and the other for sold dwellings. The estimated equations were in turn to be used to predict market rents and prices. Second were data on the cost per square metre of floor area, in 1989 prices, of dwellings completed in Nairobi between 1985 and 1989. This data set also covered such dwelling characteristics as location and type, that is, flat, maisonette or bungalow. It was used to compute a frequency distribution of the cost per square metre for various dwelling types, and to estimate a hedonic costs equation with the cost per square metre as the explained variable and dwelling characteristics and location as the explanatory variables.

4.9.4.1 Rents, Prices and Dwelling Attributes

The data set from estate agents was processed as follows. First, checks were made for accuracy and consistency. In particular, it was important to ensure that respondents had not used the wrong units for some of the information required. Second, the data set was transferred to coding sheets from which it was typed into the computer.[16] On the coding sheets, rents and prices were expressed as absolute values, and dwelling attributes as dummy variables.

To estimate the regression equation we used Microstat, a menu driven software package that allows interactive preparation of data files as well as computation.

4.9.4.2 Cost and Dwelling Attributes

We have already seen that the information collected at the CBS comprised data on the development costs of private dwellings, as well as on location and dwelling type. The cost information was for the period 1985 to 1989 and, therefore, required conversion to a common base year. The year 1989 was selected for this purpose. The costs of dwellings completed in other years were inflated by means of the construction cost index[17] in order to express them in 1989 prices. The adjusted costs were coded as absolute values.[18] Attributes representing dwelling type, that is whether a dwelling was a flat, a maisonette or a bungalow were coded as dummy variables. These took the value one or zero depending on whether or not the attribute in question was present. The data on floor area and construction period were coded as absolute values, adjusted to take account of the characteristics of the base case dwelling. As the base case dwelling was defined as a flat of 40 square metres in area, the coded area values were, in each case, reduced by this amount. Similarly, the values of the construction time were reduced by 20

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[16] The data set from the 1983 urban housing survey by the CBS was also processed in a similar manner.

[17] The 1988 Statistical Abstract shows that on average, construction costs have been increasing at the rate of about 10 percent a year. We therefore assumed that costs had been rising at the rate of 2.5 percent every quarter. This is the percentage we used to inflate costs. Therefore, if a dwelling was completed in the second quarter of 1988, its cost would be inflated by 5 percent.

[18] The computer software used allowed the conversion of these values to natural logarithms.

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weeks, the time it took to build the base case dwelling. We discarded cases in respect to which some data were missing. In effect, complete data were obtained for about 500 projects out of 620 recorded by the CBS. The data set was checked for coding errors and then typed into the computer ready for regression analysis and computation of frequency distributions.

4.9.5 Data Collected: An Evaluation

The data collected allowed us to test various aspects of the NHC's behaviour. First, we managed to assess the productive efficiency of the Corporation relative to private developers. Second, the data made it possible to conduct an investigation of allocative efficiency and equity. Finally, we were able to assess the Corporation's performance in reference to objectives in development plans, as well as in relation to other goals set by the Corporation itself.

There are, however, data that we would have liked to obtain but which we could not. First, it would have been desirable to get data on resales of NHC dwellings. This type of information would have provided a means of cross-checking how accurately the estimated regression equation for sold dwellings predicted prices for NHC dwellings. Second, rent, price and dwelling attribute data from estate agents were not based on a random sample of dwellings. We pointed out earlier,however, that the underlying bias in this regard is likely to have been reduced by the pooling of data from firms of different sizes. Third, it would have been desirable to acquire income distribution figures on a larger sample of Nairobi City Commission tenants. This would have permitted a more robust analysis of subsidy distribution among NCC tenants than is possible with the data available. Similarly, it would have been useful to get income data on households to whom NHC dwellings had been sold. This information would have illuminated further, the equity implications of the NHC's housing programme. Fourth, data on project-specific land values would have allowed judgement to be made on how land was utilised in housing production. On the other hand, land typically accounts for only about 10 percent of total dwelling costs,[19] and this proportion is not large enough to introduce a substantial bias into our analysis of development costs. On the whole, the data collected were sufficient to allow a reasonably robust evaluation of the NHC to be made.

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[19] Figures given in Chapter 5 show this to be the case.

5. PRODUCTIVE EFFICIENCY

5.1 Introduction

This chapter has two primary aims. The first is to evaluate the productive efficiency of the NHC relative to that of private developers. The second is to highlight the important implications that a proper monitoring and control framework has for costs of public enterprise projects. Differences in costs are likely to occur for a number of reasons. First, the NHC has specific social objectives to attain, unlike other developers whose main concern is private gain. Second, the NHC and private developers may be facing different sets of external constraints. On the one hand, the market is likely to impose substantial cost discipline on private firms but little on the NHC. On the other hand, the government's monitoring and control framework may be expected to play an important role in disciplining the Corporation. Third are differences in internal constraints especially in terms of managerial incentives. These issues were discussed in Chapter 3 in the context of the relative productive efficiency of private firms and public enterprises.

We shall proceed as follows. First we are going to examine the positive reasons that the government has for using the NHC to implement its housing policies. In doing so, we shall deal separately with those aspects that, in principle, could lead to lower costs and those that have to do with wider social objectives. Second, we are going to look at the negative aspects of using the NHC from the point of view of cost efficiency. Third, since cost comparisons should be on the basis of like with like, attention will be given to specific differences between NHC and private projects, and how these will be accounted for in our cost comparisons. Finally, we shall compare costs of NHC and private projects and test the hypothesis that the NHC is productively less efficient than private developers. The supposition here is that without adequate monitoring by the government, the NHC is likely to exercise managerial discretion, leading to organizational slack and ultimately productive inefficiency relative to private developers. This investigation is based on the testing procedure for productive efficiency set out in our methodology.

5.2 Why Use the NHC?

The government uses the NHC to achieve a variety of objectives, the most important of which is certainly the provision of housing to lower-income groups. Besides this primary goal are wider social objectives such as the transfer of subsidies to beneficiaries. Our concern in this section is to consider a number of aspects that are likely to have implications for the Corporation's productive efficiency.

5.2.1 Informational Constraints

Access to government land and concessionary loans allow the NHC to implement a relatively large housing programme and to employ a full complement of technical staff comprising architects, quantity surveyors and engineers. As a result, the Corporation has managed to acquire a large pool of technical information on property development. In contrast, most private developers are relatively small enterprises that are unlikely to be specialists in property development. In Chapter 4 we mentioned that of some 593 property companies in the country, about 90 percent did not have more than four employees and only four are reported to have employed more than 50 people. It is difficult, therefore, for many of these firms to build up within their organizations, a significant body of technical knowledge. Instead, they tend to rely on consulting firms for technical services. There is, therefore, bound to be a problem of asymmetric information between private developers and consulting firms, on the one hand, and between private developers and contractors, on the other. This in turn suggests that private developers will not be able effectively to monitor their consultants and contractors.[1]

To the extent that the problem of asymmetric information discussed here is confined largely to private developers, these firms could, all other things being equal, be less cost efficient than the NHC.

5.2.2 Scale Economies

NHC projects are significantly larger than projects by private developers. For instance, projects completed by the NHC between January 1985 and June 1987 had an average size of 76 dwellings and an average value of about KSh 6.0 million, and those under construction 82 dwellings and KSh 7.5 million, respectively. Rather exceptional are two recent projects in Nairobi each consisting of about 1,000 dwellings at an average project value of KSh 300 million.[2] Private projects, on the other hand, are dominated by the single building project, with projects of not more than 10 dwellings accounting for about 65 percent of all dwellings. Nonetheless, there are a few cases where they consist of well over 50 dwellings with values comparable to those of NHC projects.[3] Although conjectural, two reasons seem to explain the small size of private projects. First, many projects are probably "one-off" undertakings by developers interested in building

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[1] We noted evidence of this during our fieldwork. In one case, the developer could not understand why his consulting engineers had modified the designs for water reticulation, leading to higher costs. Tenders had been invited on the basis of provisional drawings upon the insistence of the developer who wished to see construction commence as quickly as possible. When the drawings were later submitted for approval to the relevant local authority, design changes became necessary, much to the consternation of the developer. Although he later relented, he at first demanded that the extra costs be met by the consultants. In another case, one of the project implementation problems cited by the company that was to provide long-term finance was that the developers were professional doctors who lacked the necessary experience.

[2] Data on NHC projects obtained from NHC annual reports for 1985/86 and 1986/87.

[3] Based on private developer returns to the Central Bureau of Statistics.

dwellings for owner-occupation. Second, property development is risky. Private firms will therefore tend to be risk averse and, as a result, to restrict themselves to small projects at a time. In any event, commercial banks, the main providers of construction finance, are ordinarily risk averse and may be unwilling to support large projects.[4] The NHC, on the other hand, is to a large extent insulated from risk by its access to subsidised finance and land. Should there be economies of scale, either at the project level or at the level of the firm, it is perhaps the case that NHC projects would tend to be the more cost efficient.

5.2.3 Transfer of Subsidies

Besides the immediate goal of providing housing, the government also hopes to achieve, via the NHC, wider social objectives that may have implications for dwelling costs. Perhaps the most important of such objectives is the transfer of subsidies to lower-income households,[5] a measure that is meant to ensure basic housing consumption. We shall consider this wider objective and its implications for cost.

To enable it to transfer subsidies, the NHC has been given access to government land without charge, as well as to concessionary loans. In contrast, private developers must generally buy their land at market prices, thereby foregoing interest on their outlay. This represents an additional cost to the private developer. Alternatively, private developers could acquire from the private landowner the right to develop land. Here, the distribution of profits between the developer and the landowner would take account of the market price for land. For all practical purposes, therefore, private developers still have to reckon with market prices for land.[6] The market price for land per dwelling in the medium income type of project developed by the NHC and private developers is about KSh 50,000 in 1989 prices.[7] To the NHC, therefore, access to free government land in Nairobi is worth about KSh 50,000 a dwelling. This is the immediate price advantage that land alone gives the NHC over those private developers who buy land at market prices and have to include its value in their house prices. It is also a measure of the level of subsidy arising from land that the NHC could, on average, transfer to buyers.

Turning to housing finance, we saw in Chapter 2 that each year the NHC obtains concessional, long-term loans from the government. To recapitulate, the loans are generally made for 40 years at an annual interest rate of 6 percent. This long repayment period means that the NHC can use

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[4]   To contain risk, a bank could of course go into loan syndication with other banks. We have no evidence that this is common practice in Kenya.

[5]   Other examples are the promotion of domestic contractors, and experimentation, research and dissemination of information. In the 1970s and 1980s, for instance, the NHC experimented with a site and service programme.

[6]   Exceptions to this general case arise where the Commissioner of Lands (COL) allocates land to private developers on concessionary terms. This type of allocation has apparently been stopped.

[7]   Based on data from the Housing Finance Company of Kenya.

its loans first to meet development costs and second to make loans to house buyers, either directly or through local authorities. This is the procedure it uses to finance tenant-purchase and rental housing. In respect to dwellings for sale on mortgage terms, the NHC provides construction finance only, leaving it to building societies to make long-term loans to house buyers. Should such long-term finance not be forthcoming, however, the NHC can have recourse to tenant-purchase type of financing or alternatively lease its dwellings on rental terms. The long-term loans from the government, therefore, give the NHC an alternative financing method. In contrast, private developers have to borrow from commercial sources at market interest rates of about 19 percent in order to meet their requirements for construction finance. An alternative is to use their own funds where resources permit but in either case they confront market interest rates.[8] The extra financial charges that a private developer would need to pay amount to just over KSh 36,000 for a typical middle income dwelling.[9] In principle, the NHC could transfer this level of subsidy to buyers. Taking land and finance together, it appears that a cost efficient NHC could transfer a subsidy of nearly KSh 90,000 to the average buyer.

5.3 Sources of Inefficiency

In employing the NHC as its implementing agency, the government is also likely to be confronted with a number of sources of inefficiency. First, there have been deviations from standard tender procedures and this has almost certainly led to higher costs. Standard procedures require competitive bidding after contractors have been pre-qualified. Second, the Corporation may not have performed to expectations in contract enforcement. Third, the NHC cannot go bankrupt, and therefore the discipline that a competitive product market can impose is restricted. Fourth, the full impact of the managerial labour market may not be brought to bear. It is to these sources of inefficiency that we now turn.

5.3.1 Construction Contracts in Nairobi

Our purpose here is to examine construction contracts in Nairobi, in which there were significant departures from the standard tendering procedures. The reason for doing this is to highlight the cost implications of the tender procedures followed. Quite often, departures from normal procedures appear to have had more to do with considerations unrelated to social objectives. We shall consider 7 recent projects in Nairobi, whose tender particulars are shown in Table 5.1.

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8   As deposit rates are not as high as borrowing rates, the cost of using their own funds would be somewhat lower.
9   We have assumed that: a) A medium cost dwelling costs about KSh 560,000 (1989 prices) and takes one year to build and sell. b) A private developer borrows construction finance in tranches spread out uniformly over the construction period. c) He faces an annual interest rate of 19 percent or 13 percentage points higher than the interest on government loans to the NHC. The extra financial cost is therefore given by (0.5 x 560,000 x 0.13) which is equal to 36,400.

Table 5.1   NHC Construction Contracts in Nairobi

Project	Lowest Tender KSh '000	No. of Tenders	Ratio of Second Lowest Tender to Lowest Tender
Uhuru Gardens Ph. 1	20400	3	1.01
Uhuru Gardens Ph. 2	27829	4	n.a.
Uhuru Gardens Ph. 3	31000	3	1.03
Kibera Ph. 1	259000	5	n.a.
Kibera Ph. 2	204000	1 *	-
Pumwani Site A	45000	1 *	-
Pumwani Site B	12000	1 *	-
Mean	85604	-	-

Source: NHC Files
n.a. = not available
* negotiated contract

Uhuru Gardens comprised three phases implemented between 1985 and 1989. The first phase was awarded in September 1985 to the lowest of three tenderers. Tenders for the second phase were invited from four firms including the incumbent who, upon putting in the lowest bid, was awarded the contract. The third phase was at first negotiated with the incumbent but the NHC board of directors later decided that bids be invited from all the firms that had tendered for the second phase. Three tenders were received and the contract was won by the incumbent contractor who submitted the lowest tender. The average number of tenderers for NHC construction contracts in other towns is 11.[10] Given the small number of tenders in all three phases of Uhuru Gardens, collusion among the tenderers is difficult to rule out. Recourse to a larger number of tenderers in the last two phases would probably have compelled the incumbent to be more competitive, since incumbency allows the exploitation of "first mover" advantages, such as experience with site conditions. In principle, therefore, lower costs can be achieved in serial contracting, that is, employing the same contractor to undertake a series of contracts (Stone, 1983).

In respect to Kibera Phase 1, the NHC invited tenders from five contractors, asking them to submit bids within five days. This was a major departure from its usual procedures in that first, bids would normally be invited from a larger number of contractors and second, contractors would ordinarily be given at least one month in which to submit bids. This deviation from the usual tender procedures was the result of external pressure to start project implementation quickly

[10] This average is based on tenders for 22 construction contracts in towns other than Nairobi.

(Discussion with NHC, 1989). NHC officials estimated that the winning quotation was about 80 percent higher than the cost competitive price. This estimate was based on a comparison between priced work items in the bills of quantities for Kibera and other comparable projects whose contracts were let on competitive terms.

Construction of Kibera Phase 2 started in 1989. This project was not let on competitive terms either, but was negotiated with the incumbent. The NHC reported that prices were based on the rates for Kibera Phase 1, which as we have already pointed out, were not cost competitive. As the advantages that serial contracting offers were not exploited, it is unlikely that this project is cost efficient.

There also was a departure from standard tender procedures in the award of the Pumwani contract. Negotiations were held with two contractors, one to build 228 flats and the other 56 flats. Further, bills of quantities were not available to guide negotiations. Given that there was no binding price, the NHC and the contractor are likely to have had considerable room for discretionary behaviour, both at negotiations and during construction.

The overall impression seems to be that the Corporation's framework for monitoring and control failed, leading to productive inefficiency.

5.3.2 Enforcement of Contracts

We are now going to examine yet another probable source of inefficiency, that is, the enforcement of contracts. Construction is a complex process that brings together many participants and activities (Hillebrandt, 1984). In the traditional approach to organizing construction, which is the most common, the client enters into separate contracts with each of his technical consultants,[11] as well as with the contractor. It is customary for the contractor, in turn, to appoint a number of subcontractors, some nominated by the client and others of his own choice. There is no contractual relationship, however, between the client and subcontractors.

In comparing the NHC with private developers, we need to consider the enforcement of two types of contracts. The first is the contract between the client and consulting firms, and the second that between the client and the contractor.

As the NHC employs most of the technical staff it requires, it in effect uses a variant of the traditional approach. In other words, it confines its transactions on design and allied services within the firm. In contrast, the private developer commonly retains the services of consulting

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[11] Usually the architect, quantity surveyor, and engineer.

firms and therefore transacts across markets. This distinction is important in the sense that the two methods of arranging transactions may not be equally cost-efficient (Williamson, 1979).

We saw earlier that many private developers are small firms with access to relatively little technical information. As a result, there are probably severe problems of asymmetric information between such firms and their consultants. This implies that the private developer will find it difficult to monitor the consultant.[12] On the other hand, the NHC faces the problem of monitoring employment contracts between itself and its professional staff.

In essence, the NHC and private developers alike are confronted by the principal-agent problem. As transaction costs are incurred both across markets and within firms, the more efficient alternative becomes an empirical question. However, the widely differing conditions under which the NHC and private developers operate are likely to lead to different outcomes.

We now turn to the contract between the client and the contractor. The NHC supervises its contractors directly and, therefore, faces the standard principal-agent problem. In contrast, contractors retained by private developers are almost invariably supervised by consultants. There are, therefore, two related principal-agent problems here, the first between the client and the consultant and the second between the consultant, acting on behalf of the client, and the contractor. Again, the more cost effective arrangement is likely to be an empirical matter.

5.3.3 Product Market

We will now look at the third source of inefficiency. The NHC and private developers face a competitive product market in which they are both price takers. Competition, however, has different impacts on these two types of organization. As the NHC cannot go bankrupt, it is insulated from the market. Indeed, the Corporation's exposure to the market declines significantly where a substantial proportion of its output is sold to local authorities. It is improbable, therefore, that competition will fully impel the NHC towards achieving lower costs. In contrast, private developers are disciplined by the market. Given that property development is likely to be competitive and that it is almost certainly not a declining cost industry, developers who are not productively efficient will probably make losses and, as a result, face the prospects of bankruptcy. Private firms are also vulnerable to random events and a risky environment. We shall use an example to illustrate the Corporation's insulation from the discipline of market forces.

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[12] To some extent this problem is alleviated by the existence of codes of conduct for consultants. Such codes try to limit administratively, the conduct of the consultant in discharging his responsibilities to the client.

In 1983, the NHC developed 32 houses at Nanyuki, a relatively small town, and advertised them for sale. There was little demand for the houses, and in a letter to the Housing Finance Company of Kenya, the institution supposed to make mortgage loans, the NHC reported that only five applicants had paid the necessary deposits. This outcome, according to the NHC, was brought about by high construction costs. In turn, high construction costs arose from the "unforeseen" difficulties of dealing with a site containing black cotton soil. In the circumstance, costs had risen substantially, and the HFCK was therefore not willing to commit long-term funds towards the project. Faced with this prospect, the NHC attempted, but failed, to sell the houses to the government. Subsequently, a professional firm of estate agents retained by the NHC to market the houses had the following to say,

> "Last year, we advised you that the houses were worth KSh 250,000 in the open market and could be let at at KSh 2,200 per month. We have tried to sell the houses at these figures (sic) which are much lower than the costs incurred in putting up the houses, but up to now nothing has materialized; the reason being of course lack of demand owing to the size of the town presently and the standards of living there".[13]

After remaining unoccupied for three years, the houses were leased to the government each at a rent of KSh 1,200 per month. In addition to the rent foregone during this period, the relatively low rent level meant that the NHC would earn a rate of return well below the opportunity cost of capital. The losses incurred were written-off. It is unlikely that the typical private developer would have undertaken such a project. Indeed, our investigations revealed that the larger private developers quite often carry out market surveys before committing their resources to a project. Further, their production programme, unlike that of the NHC, almost invariably ensures that houses are sold in small batches as they are completed. By so doing, private developers incur relatively lower financial charges. This approach to production is influenced by the market.

5.3.4 Managerial Labour Market

In Chapter 3 we discussed how managers are disciplined by the labour market. We noted, however, that where public enterprise managers are selected via a political process their tendency towards discretionary behaviour is not restrained by the labour market. Private developers, on the other hand, are practically all small firms that are unlikely to provide substantial markets for managerial labour. The labour market argument is, in this context, likely to be irrelevant. Where the firms are owner-managed there is little attenuation of property rights and less organizational slack than at the NHC.

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[13]   Source: Letter dated 22nd January, 1986 from the firm of estate agents to the NHC.

In Table 5.2 we have summarised the probable directional effect on costs of the various factors discussed above. A plus sign indicates higher costs, and a minus sign has the opposite meaning. A question mark means that the direction of the effect is ambiguous.

Table 5.2 Probable Directional Effects of Various Factors
on Costs of NHC and Private Developers.

	NHC	Private Developers
Informational Constraints	–	+
Scale Economies	?	?
Negotiated Contracts	+	?
Product Market	+	–
Managerial Labour Market	+	?

We can conclude our previous analysis by saying that from the standpoint of cost efficiency, there are advantages and disadvantages facing both the NHC and private developers. The outcome depends, therefore, on which of the factors discussed above are dominant.

5.4 Relative Productive Efficiency

Having looked at various behavioural aspects of the NHC and private developers, we are now in a position to examine relative productive efficiency. To do this, we shall first divide the NHC's projects into three groups. The first group consists of projects distinguished by three main features. These are that dwellings are of basic design, competitive construction tenders were invited and the projects are relatively small. The second NHC group is also made up of projects of basic design, but the tendering process was not competitive and projects are relatively large. The third group comprises middle income housing projects whose contracts were let, in most cases, on a competitive basis.

For purposes of making comparisons with NHC projects, private developers' projects are divided into two groups. The first group is made up of middle-income projects, data on which were supplied by the Housing Finance Company of Kenya (HFCK). The second group contains middle- to high-income projects whose particulars were obtained from statistical returns by developers to the Central Bureau of Statistics (CBS).

Three sets of cost comparisons will be made. The first set will be between the first and second groups of NHC projects. The second set of comparisons will be between the third group of NHC projects and the first group of projects by private developers. The third set will be between the third group of NHC projects and the second group of private projects. In order to make it clearer, this comparison scheme is illustrated in Table 5.3. In that table, too, we have outlined the main attributes of the respective projects.

Table 5.3   Comparison Scheme for Projects

1st Set
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	Group 1 of NHC Projects (Tenant Purchase and Rental Projects)	Group 2 of NHC Projects (Kibera Ph.1 and Pumwani Sites A and B)
Main Project Attributes	: Basic design : Competitive tenders : Relatively small projects	: Basic design : Non-competitive tenders : Relatively large projects

2nd Set
_____

	Group 3 of NHC Projects	Group 1 of Private Developers' Projects (HFCK Data)
Main Project Attributes	: Middle-income housing : Competitive tenders* : Relatively large projects	: Middle-income housing : Competitive tenders : Relatively large projects

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	Group 3 of NHC Projects	Group 2 of Private Developers' Projects (CBS Data)
Main project Attributes	: Middle income housing	: Middle- to high- income housing
	: Competitive tenders*	: Competitive tenders
	: Relatively large projects	: One-dwelling projects predominate

* Uhuru Gardens is in this group although its tenders may not have been entirely competitive.

An ideal setting for making comparisons would have been one where a large number of project groups were available, each differing from the other by a single but different attribute. In such a setting, the first group of projects could act as the control group and relative changes in costs would be identified by varying one attribute at a time. This type of comparison is, however, not possible, as such ideal groups do not exist.

Nonetheless, the comparison scheme in Table 5.3 does, within the limitations of the data available, seem sensible. One of the main limitations is that no two projects are identical and it may not always be possible to control for differences satisfactorily. Another is that the sample of Group 1 of private developers' projects is not as large as would have been desirable.

In the first set, the two groups have similar product dimensions but have different project sizes. Projects in one group were let on a competitive basis while those in the other were not. This is likely to be the dominant difference from the point of view of cost efficiency.

In the second set, the projects have similar product dimensions. The projects are of comparable size and dwellings fall into the middle-income category. The main difference is one of ownership. One group consists of projects sponsored by the NHC and the other of private projects. Here, cost differences, if any, could largely be attributable to ownership.

In the third set, there are some differences in project dimensions. NHC projects are in most instances much larger than private projects, a matter that we mentioned earlier. In addition, the private dwellings drawn from the CBS data set tend to fall into middle- and high-income categories.

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To make cost comparisons we shall employ the unit cost of development, excluding land, and in the next section we describe how this unit cost was calculated. We shall supplement this approach by estimating a hedonic costs equation. The equation has not been used as the principal method of comparing costs because, as we see later, its explanatory power is not very high. However, the method provides a more systematic tool for correcting for differences between NHC and private projects, thereby reducing the biases implicit in the comparison scheme for projects set out in Table 5.3. It also allows us to cross-check the validity of the results based on that scheme.

5.5 Comparing Costs

As we said in Chapter 4, the costs we use in our comparisons are the total development costs, excluding land. The unit costs shown in Table 5.4 have been calculated by dividing the development cost, as defined, by the floor area of a dwelling.

Table 5.4   Cost Comparisons   Costs in Ksh., 1989 Prices

1st Set Comprising Groups 1 and 2 of NHC Projects					
Group 1				Group 2	
Project	No. of Units	Cost per Square Metre	Project	No. of Units	Cost per Square Metre
Naivasha	75	3206	Kibera	980	7815*
Kitui	30	3371	Pumwani		
Kakamega	200	3111	Site A	228 }	4869
Siaya	150	2388	Site B	56 }	
Kiambu	56	3637			
Londiani	50	4636			
Isiolo	100	2765*			
Narok	30	3355*			
Machakos	55	2550*			
Nyahururu	50	2095			
Mean Cost		2990			7153

* Final cost figures were not available and are likely to be higher than those shown.

Table 5.4 contd.

2nd Set Comprising Group 3 of NHC Projects and
Group 1 of Private Developers' Projects.

Group 3 NHC Projects			Group 1 Private Developers' Projects		
Project	No. of Units	Cost per Square Metre	Project	No. of Units	Cost per Square Metre
Uhuru Gardens			Prudential	86	5615
Phase 1	71	4615	Highway	107	4682
Phase 2	83	4774	Jokim	75	4046
Phase 3	87	4774	Suna*	123	8657
Onyonka	284	5450			
Nyeri	45	6940			
Kiboko	50	4768			
Mean cost		5213			4803**
					6015***

*   Competitive tenders not invited; high costs of infrastructure.
** Excluding Suna *** Including Suna

3rd Set Comprising Group 3 of NHC Projects and
Group 2 of Private Developers' Projects

Group 3 NHC Projects			Group 2 Private Developers' Projects		
Project	No. of Units	Cost per Square Metre	No. of Projects	Cost per Square Metre	Standard Deviation
Uhuru Gardens					
Phase 1	81	4615	118 *	2980	904
Phase 2	83	4774	143 **	3425	937
Phase 3	87	4774	232 ***	3696	1081
Onyonka	284	5450			
Nyeri	45	6940			
Kiboko	50	4768			
Mean Cost		5213		3446	1039

* Flats ** Maisonettes *** Bungalows

5.6 Discussion of Results

5.6.1 1st Set of Comparisons

The results in Table 5.4 (1st set of comparisons) show that the average cost per square metre for Group 2 of NHC projects (that is Kibera Phase 1 and Pumwani) at KSh 7153, is about 2.4 times as high as for Group 1 projects (also by the NHC). To determine what accounts for this substantial difference, we need to examine a number of potential causes. As both project groups are sponsored by the NHC, ownership and factor prices are clearly not at issue. The aspects that we need to examine, therefore, are product dimensions, scale economies and and the monitoring and control framework. We are going to look at these aspects in turn.

5.6.1.1 Product Dimensions

We saw earlier that all the NHC projects in Groups 1 and 2 are of comparable design standards and can therefore be said to have, more or less, similar product dimensions. While design standards might be similar, differences in site conditions could nevertheless introduce varying impacts on cost. In other words, if the sites for Group 2 projects were on the whole substantially more difficult than those for Group 1 projects, unit costs would tend to be higher in the former case. As it turns out, some of the sites in Group 1 were relatively difficult to build on, especially those in Isiolo (black cotton soil), Londiani (black cotton soil), and Machakos (steep slope). In as far as Group 2 is concerned, the NHC considered Kibera to have been a difficult site. The site is rocky, a feature that tends to raise costs because excavation in rock is expensive. Cost data supplied by the NHC show that all work items that were likely to be affected by the presence of rock[14] accounted for about 18 percent of the net construction cost.[15] If we reduced the development cost by this proportion, a measure that overstates[16] the relative difference between a rocky and a normal site, the remainder is a square metre cost of about KSh 6,400 still over twice as high as the average unit cost for Group 1 projects. In other words, after standardising for site conditions there remains a substantial cost difference between Kibera and the typical NHC project. It is unlikely, therefore, that differences in product dimensions explain the substantial differences in cost between the two groups.

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[14] These are foundations, basements, retaining walls, and external works i.e. excavation for roads, footpaths, parking spaces, and water and sewer pipes.

[15] Net of professional fees and interest on construction finance.

[16] The omission of all work items requiring excavation in rock is equivalent to assuming that for normal sites no costs are incurred in carrying out work relating to foundations and external works.

5.6.1.2 Scale Economies

Basing our judgement on the unit cost in Group 1, which contains projects ranging in size from 30 to 200 dwellings, there does not appear to be any systematic relationship between cost and project size. As we see later, the hedonic costs equation, which is estimated using a much larger sample of projects, yields a similar result. Whilst this lack of evidence may not completely rule out the existence of scale economies (or diseconomies), it does suggest that their impact is not significant.

Having discounted product dimensions and scale economies as the principal causes of the cost differences, we are left with the monitoring and control framework as the probable cause.

5.6.1.3 Monitoring and Control Framework

We saw earlier that in respect to Kibera Phase 1, the NHC had to obtain bids within five days, in itself a drastic departure from the usual tender procedures. With regard to Pumwani, contracts for Site A and Site B were awarded on the basis of negotiations. In both cases, therefore, there was no proper monitoring and control of the agent by the principal. Group 1 projects, in contrast, were closely monitored by the USAID, the donor agency through which project funding had been arranged. It will be recalled that in Chapter 2, we discussed the likely effect on costs of control by donor agencies. To recapitulate, we drew attention to the strict control on project design and tender procedures that the USAID imposed on the NHC. This probably explains the relatively low unit cost of Group 1 projects. It is invariably the case that public sector efficiency depends on the proper monitoring of the agent by the principal and the lack of such monitoring seems to explain the relatively high unit costs of Group 2 projects.

5.6.2 2nd Set of Comparisons

The 2nd set of comparisons in Table 5.4 shows that the average cost per square metre of NHC projects (Group 3) is KSh 5213 and that of private projects (Group 1) KSh 6015. If Suna estate, whose contract was not let on a competitive basis is excluded,[17] the average cost falls to KSh 4803. Here, as in the case of Kibera Phase 1, the non-invitation of competitive tenders appears to be associated with unusually high costs.

The main difference between the two groups of projects is one of ownership. Another difference, though less important, has to do with prices of factor inputs. Our investigations showed that the NHC's financial charges are based on an annual interest rate of 13 percent. Its

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[17] Substantial costs were incurred at Suna on off-site infrastructure.

costs should, therefore, be increased by about 3 percent to make them comparable to private developers' costs.[18] In as far as land is concerned, an adjustment should in principle be made to reflect the interest the private developer foregoes on his outlay on land. This amounts to about 2 percent of the capital cost[19] and would not substantially affect the relative magnitudes shown in Table 5.4.

Projects in the two groups are more or less similar in terms of product dimensions and size. In both cases, dwellings generally comprise semi-detached or terraced maisonettes.

The unit cost figures strongly suggest that the NHC is as cost efficient as private developers. Indeed, when Suna estate is included in the group of private projects, the NHC's performance is superior in terms of cost efficiency.

5.6.3 3rd Set of Comparisons

In the 3rd set, cost comparisons are made between Group 3 of NHC projects and Group 2 of private developers' projects. We have already seen that Group 3 of NHC projects, with an average cost per square metre of KSh 5213, generally comprise middle income maisonettes. Group 2 of private projects, data on which were obtained from the CBS, consist of 118 projects of flats, 143 projects of maisonettes, and 232 projects of bungalows. The average cost per square metre is KSh 3446. The standard deviation, with a value of 1039, is very large indicating that the population of unit costs is widely dispersed.[20] Even taking this dispersion into account, it is apparent that the average cost of NHC dwellings (Group 3) at KSh 5,213 is significantly higher than the average cost of private dwellings (Group 2) at KSh 3,446. This implies that in relative terms, the NHC is productively inefficient. This appears to contradict our earlier comparison in the 2nd set between the same group of NHC dwellings and Group 1 of private dwellings. There, we saw that the NHC is at least as productively efficient as private developers. In an attempt to explain this apparent contradiction, we compared the two groups of private projects. Group 2 contains middle- to high-income dwellings and its unit cost should, on average, be comparable to that of Group 1, which it is not. It would appear, therefore, that the cost difference is not explained by differences in product dimensions. It is also not obvious that the difference is attributable to scale economies for as we saw earlier, there does not appear to be any systematic relationship between unit cost and project size. Nevertheless, the outstanding difference between

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[18] This assumes that private developers borrow at 19 percent per year, or 6 percentage points above the NHC interest rate. If bridging finance is drawn down more or less uniformly over the construction period, which is assumed to be one year, the additional cost incurred by the private developer is approximately equal to 3 percent.

[19] Earlier we saw that land accounts for about 10 percent of the value of a typical dwelling. If we took the value of a dwelling to be 100 units, the amount apportionable to land is 10 units. Assuming that development takes one year, interest on this amount at 19 per cent per year amounts to 1.9 units.

[20] A frequency distribution of the cost per square metre is given in Appendix 3.

the two groups is still one of size. Group 1 consists of relatively large projects whilst Group 2 is, as we said earlier, dominated by the single dwelling project. Small projects are technically and financially less demanding to implement and this could explain the lower unit costs. This explanation is speculative, and it could very well be that in spite of our attempts to restrict comparisons to similar project groups, differences in attributes are still significant. Our investigations certainly indicated that those private firms that develop relatively large projects do confront substantial difficulties during project implementation.[21]

5.6.4 Further Cost Comparisons

In order to cross-check the results yielded by the comparison scheme in Table 5.3, we estimated a hedonic costs equation. To do this, we regressed the logarithm of unit cost on project type (that is whether a low-income or higher-income type of project), tender procedures, ownership category (that is developed by the NHC or by a private firm), and project size. It was hoped that this supplementary method would give further indication of whether or not our tentative conclusions were justified.

The following is the multiple regression equation estimated.

$$\ln C = B_0 + B_1.\text{TYPE} + B_2.\text{TENDER} + B_3.\text{OWNER} + B_4.\text{SIZE} + e,$$

where $\ln C$, the explained variable is the natural logarithm of the cost per square metre, B_0 is the constant term, B_1 to B_4 are the coefficients to be estimated, TYPE, TENDER, OWNER and SIZE are the explanatory variables and e is a random error term. The explanatory variables, with the exception of SIZE, were expressed as dummy variables. SIZE was used to measure project size in number of dwellings. The dummy variables were specified as follows.

TYPE = 0 if the project is a low-income project, 1 otherwise,

TENDER = 0 if the project is let on competitive tender, 1 otherwise,

OWNER = 0 if project developed by the NHC, 1 otherwise,

The use of dummy variables requires that a "base case" be defined to which results are compared (Maddala, 1983). We defined the base case project as a low-income, NHC project let on competitive tender.

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[21] This conclusion is based on our examination of project files at a firm of consulting engineers.

An ordinary least squares estimate was obtained using data on 67 projects made up as follows:

(a) Private projects on which data were provided by the HFCK (that is, Group 1 of private projects): 4 no.

(b) All private projects completed in 1989, drawn from the CBS data set (that is a subset of Group 2 of private projects) : 45 no.

(c) Groups 1, 2, and 3 of NHC projects: 18 no.

The following results were obtained.

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DEPENDENT VARIABLE: lncost
Variable       Regression  Standard T(DF=62) Probability Partial r^2
               Coefficient Error
TYPE              .5424      .1430   3.793     .00034      .1883
TENDER            .6320      .2365   2.672     .00962      .1033
OWNER            -.3023      .1281  -2.361     .02139      .0825
SIZE             -.0003     -.0004    .807     .42296      .0104
CONSTANT         7.9729

Standard error of estimate  = .2802

Adjusted R squared = .2773
        R squared = .3211
     Multiple R = .5666

          Analysis of Variance

Source          Sum of Squares   DF   Mean Square  F Ratio  Probability
Regression         2.3020         4      .5755     7.331     6.696E-05
Residual           4.8674        62      .0785
Total              7.1694        66
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The estimated equation, with an F value of 7.3, is significant at the one percent level, suggesting that the relationship between the explained and explanatory variables is not spurious. Its explanatory power, as measured by the adjusted R^2 is, however, relatively low. The coefficients of the variables TYPE and TENDER are significant at the one percent level, and that of OWNER at the 5 percent level. The SIZE coefficient is not significant and is also very small relative to the other coefficients. The TYPE and TENDER coefficients have the correct signs but the negative sign of the OWNER coefficient probably reflects the lower costs to be found in the single dwelling type of project favoured by private developers.

These results are largely consistent with our earlier findings. For instance, the square metre

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cost of the base case dwelling, which is given by the constant term, works out as KSh 2900.[22] A shift to a higher-income type of project let on competitive terms raises the cost to KSh 4990 per square metre[23] while the unit cost of a higher-income, private project which is negotiated is KSh 6634.[24] Various combinations can be obtained by adding the relevant coefficients to the constant term. Finally, the SIZE coefficient, which is not significant, is consistent with our earlier observation that there do not appear to be scale economies at the project level.

5.7 Hypothesis Testing

We started with the hypothesis that without adequate monitoring by the government, the NHC is likely to exercise managerial discretion, leading to organizational slack and ultimately to productive inefficiency, as compared to private developers. In contrast, private developers are small firms that are probably owner-managed. Moreover, as they are not "insured" against losses and are confronted with a competitive market, private firms that are not productively efficient would face the prospects of bankruptcy. It could be hypothesized, therefore, that the NHC is relatively less cost efficient than private developers. On the other hand, the Corporation could achieve lower costs because its better access to technical information probably makes it more competent in project monitoring.

Comparisons between costs of NHC and private projects that are similar in terms of size and design has shown that the NHC is at least as cost efficient as private developers. Indeed, the NHC's performance turns out to be superior when a private project that was negotiated is taken into account. On the basis of this evidence, the hypothesis that the NHC is productively inefficient relative to private developers is rejected.

We have also established that the typical private project is rather small relative to NHC projects. In fact the typical private project consists of a single dwelling.[25] For this type of project, the private developer produces at a relatively lower cost, but as the NHC does not undertake similar projects, relative efficiency cannot be assessed by means of a straightforward cost comparison.

Our analysis has shown that NHC construction contracts that are not let on competitive terms are relatively cost inefficient. To this extent, the NHC can be considered to be productively

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22 Antilog 7.9729. The actual average cost (see Table 5.4, Group 1 of NHC projects) is KSh 2990 or 3 percent higher.

23 Antilog (7.9729 + .5424). The actual average cost (see Table 5.4, Group 3 of NHC projects) is KSh 5213 or 4 percent higher.

24 Antilog (7.9279 + .5424 + .6320 - .3023). This is about 10 percent higher than the unit cost at Suna (see Table 5.4, Group 1 of private projects).

25 Nevertheless, the value of total production of the private sector has in recent years exceeded that of the public sector (Source: Statistical Abstracts, 1988, 1989).

inefficient. There is evidence, though not sufficient, that negotiated private projects can also be equally cost inefficient. Finally, the monitoring and control framework seems to have failed in respect to the large NHC projects in Nairobi, mainly as a result of the political environment in which the NHC operates. There is some validity, therefore, in arguing that smaller projects would have been more cost-efficient.

5.8 Summary

This chapter set out to investigate the productive efficiency of the NHC relative to private developers, and to highlight the importance of the government's framework for monitoring and control. We began by outlining the positive reasons that the government has for using the NHC to implement housing policy and second, the wider objectives that the Corporation is expected to attain. In this regard, attention was given to the likely implications for cost. Third, we looked at the sources of inefficiency that could affect the operations of the Corporation. Finally, we compared costs of NHC and private projects in order to test the hypothesis that the NHC is productively less efficient than private developers.

Our overall conclusion was that the NHC is as productively efficient as private developers. This conclusion, however, was subject to the important caveat that, in a few relatively large projects in Nairobi, substantial inefficiency had been introduced by the absence of a proper system of monitoring and control. It seemed, therefore, that as long as the Corporation restricted itself to small and medium sized projects, which appeared less prone to negative external intervention, it was no less efficient than private developers. In any case, there did not appear to be evidence of economies of scale suggesting that small and medium sized projects would ordinarily be as cost efficient as large projects. Given the lack of systematic evidence, we could not accept the hypothesis that the NHC is less cost-efficient than private developers.

6. ALLOCATIVE EFFICIENCY

6.1 Introduction

In an ideal housing market rents and prices would reflect the long-run marginal cost (LRMC) of housing provision. Second, the rate of return on housing investment would be equal to returns on other investments of equivalent risk (Grey et al., 1981; Whitehead and Kleinman, 1988). These attributes allow us to devise testing procedures for allocative efficiency. To start with, the divergence between actual rents and prices, on the one hand, and the LRMC, on the other, would measure the degree of allocative inefficiency. Equivalently, inefficiency could be measured in terms of the divergence between the actual rate of return and the long-run equilibrium rate of return. It is important to emphasize here that a divergence between actual prices and the LRMC does not necessarily reflect allocative inefficiency since, for reasons of social efficiency, a government may introduce prices different to the LRMC.

Yet another insight into allocative efficiency is given by the divergence between the actual marginal cost and the LRMC. As we pointed out in Chapter 3, productive efficiency is a necessary, though not sufficient, condition for allocative efficiency. Since aspects of productive efficiency have already been examined, the divergence between the actual marginal cost and the LRMC will not be discussed here. Our analysis will be confined largely to the divergence between NHC prices and the LRMC.

Housing markets almost invariably deviate from the ideal state in some important respects and, as a result, long-run equilibrium is difficult to achieve. Inevitably, therefore, market prices and rents reflect short-run marginal costs and not the LRMC of housing provision. For this reason, we will investigate allocative efficiency in the context of two sets of assumptions. The first assumption is that market prices reflect the LRMC of housing provision whilst the second is that these magnitudes diverge.

We will proceed as follows. First, we are going to use the hedonic price approach set out in Chapter 4 to determine whether or not NHC rents and prices diverge from market rents and prices. Second, we shall assess the implications of the measured divergences assuming, on the one hand, a market in long-run equilibrium and, on the other hand, a market in disequilibrium. Finally, we shall compare the NHC's rates of return with the predicted market rates of return and test the hypothesis that the Corporation's rents and prices are allocatively inefficient. Our analysis is based on the 1989 rent, price and cost data described in Chapter 4.

6.2 The Regression Equation

Our first concern is to estimate a multiple regression equation that will then be employed to predict market rents and prices for NHC dwellings. The use of multiple regression analysis to compare different dwellings was discussed in Chapter 4. Here, we are primarily concerned with the application of the method, as its associated assumptions and difficulties were considered in that chapter. To recapitulate, we said that the rent for a dwelling (or equivalently its price) can be expressed as a function of its attributes as follows.

$$P = B_0 + B_1X_1 + B_2X_2 \dots + B_nX_n + e$$

where P is the response variable representing rent (or price), B_0 is the intercept, X_1 to X_n are the explanatory variables or regressors representing the attributes of a dwelling, B_1 to B_n are their coefficients and e is an error term. Each coefficient measures the change in the response variable arising from a change in the respective regressor, when all other variables are held constant. If we estimated such an equation for Nairobi, using dwellings let at market rents, we could then use the fitted equation to predict market rents for NHC rental housing. Similarly, an equation estimated using price data could be used to predict market prices for dwellings sold by the NHC. Moreover, the fitted equation for sold dwellings would allow us to calculate the capital value of NHC rental housing and, therefore, the gross rate of return. Conversely, the equation for rental housing would allow us to calculate the gross rate of return on sold dwellings.

In order to estimate a suitable equation, three problems must be addressed. The first concerns which attributes of a dwelling should be selected as the determinants of its rent. The second is how these attributes should be measured. The third has to do with the functional form of the equation that gives a reliable representation of the relationship between rent and the attributes of a dwelling. We now turn to a discussion of these aspects.

6.2.1 Selection of Attributes

Ideally, the attributes selected should have independent impacts on price, the explained variable. Further, all the important dwelling-specific and neighbourhood attributes should be included in the equation to be estimated. In practice, many attributes tend to be found together in similar dwellings and it is therefore difficult to avoid multicollinearity (Butler, 1982). Later, we look at the implications of this problem for our results and the measures we took to contain it. In addition, information may not be available on all the important attributes. This need not be a serious problem, especially where a given attribute can be represented by other attributes. As we noted in Chapter 4, a number of the estate agency firms that responded to our request for data did

not have ready information on attributes such as floor area and plot size. As an alternative, therefore, the number of rooms, an attribute that was well-documented in practically all cases, was used to represent dwelling size.

6.2.2 Measurement of Attributes

Dwelling attributes can be represented by means of either categorical or continuous variables, the choice depending on the attribute in question. For instance, the number of rooms in a dwelling is not a continuous variable[1] and can therefore be represented only by means of a categorical or dummy variable. In contrast, by way of example, the distance between the location of a dwelling and the city centre can be expressed either as a continuous variable or as a categorical variable. As a continuous variable, the actual measured distance would be used in the equation. Alternatively, distance could be grouped (e.g. $0 < 10$ kilometres; > 10 kilometres) making it possible to represent it by means of dummy variables as follows:

$X_1 = 1$ where distance is less than 10 kilometres
$X_1 = 0$ where distance is greater than 10 kilometres

All variables in the estimated equation were expressed as dummy variables.

6.2.3 The Functional Form

In Chapter 4 we saw that there are several functional forms of the multiple regression equation that can be used to relate rent to the attributes of a dwelling. An earlier study of housing in Nairobi suggested that a semi-log functional form would yield satisfactory results (Mutero, 1988). In this study we estimated the following semi-log equation:

$$\ln P = B_0 + B_1 X_1 + B_2 X_2 + \ldots + B_n X_n + e$$

6.3 Estimation of the Regression Equations

6.3.1 The Explanatory Variables

The explanatory variables employed in the regression equations,[2] expressed in dummy form, covered mainly the attributes of dwelling size, location, and distance from the city centre. The use of dummy variables, as we have already seen, requires that a base case be established to which

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[1] An alternative would be to measure dwelling size in terms of area, a continuous variable.
[2] One equation for sold dwellings and the other for rented dwellings.

all other cases are compared (Maddala, 1983). The base case for sold dwellings was defined as a three-roomed dwelling on freehold tenure, having one water-closet but no servants quarters and located in a low-income area beyond 10 kilometres of the city centre. For rental housing, an equivalent definition was used with the exception that the location of the dwelling was taken to be within 5 kilometres of the city centre.[3]

The specification of dummy variables requires that there be one dummy less than the number of categories under consideration (Maddala, 1983). It is the omitted category that defines the base case. With this in mind, the dummy variables common to sold and rental dwellings were specified as follows:

ROOM4 = 1 if dwelling has 4 rooms, 0 otherwise
ROOM5 = 1 if dwelling has 5 rooms, 0 otherwise
R00M6+ = 1 if dwelling has 6 rooms or more, 0 otherwise
WC2 = 1 if dwelling has two or more water closets, 0 otherwise
SQ = 1 if dwelling has servants quarters, 0 otherwise
MEDINC = 1 if dwelling located in a medium income area, 0 otherwise
HIGHINC1 = 1 if dwelling located in a high income area, 0 otherwise
HIGHINC2 = 1 if dwelling located in an exclusive, high income area, 0 otherwise

Other dummy variables were defined as follows:

For sold dwellings:

LSHOLD = 1 if dwelling on leasehold terms, 0 otherwise
DIST010 = 1 if dwelling located within 10 kilometres of the city centre, 0 otherwise

For rental dwellings:

DIST610 = 1 if dwelling located between 6 and 10 kilometres of the city centre, 0 otherwise
DIST10+ = 1 if dwelling located beyond 10 kilometres, 0 otherwise

6.4 Estimated Equations for Sold Dwellings

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[3] For rental housing, land tenure was disregarded.

6.4.1 Estimating Procedure

To start with, two ordinary least squares (OLS) estimates of the regression equation were made using the 1989 price and dwelling attribute data obtained from estate agents. The first estimate included all the variables. The second used the stepwise method described in Snedecor and Cochran (1980).[4] After a first computer run, we excluded five dwellings which were identified as outliers.[5] This left us with 97 dwellings for the final run. The results obtained were as follows.

6.4.2 Regression Results

a) Full Regression (i.e. regression with all variables included)

Dependent Variable: LOGPRICE

Variable	Regression Coefficient	Standard Error	t-Ratio (DF=86)	Probability	Partial r^2
ROOM4	.0653	.1036	.630	.53057	.0046
ROOM5	.1086	.1155	.940	.34960	.0102
ROOM6+	.2755	.1356	2.031	.04535	.0458
WC2	.2510	.0683	3.674	.00041	.1357
SQ	.2925	.0637	4.593	.00001	.1970
MEDINC	.5125	.0957	5.354	.00000	.2500
HIGHINC1	.9941	.1245	7.984	.00000	.4257
HIGHINC2	1.8844	.1121	16.816	.00000	.7668
DIST010	.2163	.0666	3.250	.00165	.1094
LSHOLD	-.0427	.0923	-.462	.64500	.0025
CONSTANT	12.2416				

Standard error of estimate = .2387
Adjusted R squared = .9175
R squared   = .9261
Multiple R   = .9624

Analysis of Variance

Source	Sum of Squares	DF	Mean Square	F Ratio	Probability
Regression	61.4144	10	6.1414	107.831	.00000
Residual	4.8981	86	.0570		
Total	66.3125	96			

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[4] In the stepwise regression an F value of 2 was used for the inclusion of individual regressors.

[5] The computer program used printed standardised residuals or errors, on the basis of which we were able to identify the outliers.

To investigate multicollinearity, we examined the extent to which values of the variables changed, one with another. A correlation matrix of the variables showed a very high correlation coefficient between HIGHINC2 and LOGPRICE ($r=.7932$) meaning that location in an exclusive, high income area explains nearly 80 percent of the dependent variable. As the NHC does not develop housing in such areas, we considered it prudent to estimate another equation in which the variable HIGHINC2 was excluded. Nineteen dwellings located in HIGHINC2 neighbourhoods were discarded as a result, leaving 78 dwellings in the equation. The following results were obtained:

b) Modified Regression (i.e. HIGHINC2 excluded)

Dependent Variable: LOGPRICE

Variable	Regression Coefficient	Standard Error	t Ratio (DF=68)	Probability	Partial r^2
ROOM4	.0579	.1031	.561	.57632	.0046
ROOM5	.1081	.1176	.919	.36137	.0123
ROOM6+	.0838	.1662	.504	.61573	.0037
WC2	.2791	.0695	4.014	.00015	.1915
SQ	.2880	.0628	4.586	.00002	.2363
MEDINC	.4581	.1000	4.582	.00002	.2359
HIGHINC1	.9106	.1283	7.095	.00000	.4254
DIST010	.2502	.0790	3.167	.00230	.1286
LSHOLD	-.1437	.1139	-1.262	.21134	.0229
CONSTANT	12.3571				

Standard error of estimate = .2348
Adjusted R squared   = .8177
R squared   = .8390
Multiple R   = .9160

Analysis of Variance

Source	Sum of squares	DF	Mean square	F Ratio	Probability
Regression	19.5479	9	2.1720	39.385	6.0000E-14
Residual	3.7501	68	.0551		
Total	23.2980	77			

This equation, like the previous one, has a reasonably high R^2 (0.82), and all the regression coefficients bear the correct signs. As the constant is comparable to that obtained in the first equation, and the coefficients appear to be of a similar order of magnitude, it may be concluded that the omission of HIGHINC2 still leaves us with a suitable equation. Moreover, the coefficients seem to be stable.

c) Stepwise Regression

The results shown below were obtained after 7 steps. Later, we shall examine the sequence in which the various variables were selected.

Dependent Variable: LOGPRICE

Variable	Regression Coefficient	Standard Error	$F_{(1, 89)}$	Probability	Partial r^2
ROOM6+	.1963	.0911	4.639	.03395	.0495
WC2	.2810	.0618	20.695	.00002	.1887
SQ	.2983	.0624	22.826	.00001	.2041
MEDINC	.5026	.0916	30.112	.00000	.2528
HIGHINC1	.9920	.1232	64.849	.00000	.4215
HIGHINC2	1.8898	.1098	296.487	.00000	.7691
DIST010	.2215	.0652	11.540	.00102	.1148
CONSTANT	12.2516				

Standard error of estimate = .2363
Adjusted R squared   = .9192
R squared   = .9251
Multiple R   = .9618

Analysis of Variance

Source	Sum of Squares	DF	Mean Square	F Ratio	Probability
Regression	61.3427	7	8.7632	156.932	.00000
Residual	4.9698	89	.0558		
Total	66.3125	96			

Variables not in equation are ROOM4, ROOM5 and LSHOLD

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In the full and modified regression equations, ROOM4, ROOM5 and LSHOLD are not significant at the 5 percent level. In as far as distance is concerned, we defined the location of the base case dwelling as one beyond 10 kilometres of the city centre. The positive sign of the distance variable therefore means that price increases as one moves nearer to the city centre. This appears to be a sensible outcome for a largely monocentric city such as Nairobi and is in accord with the literature (see Straszheim, 1987). The coefficients of the other variables in the equation (i.e. WC2, SQ, MEDINC, HIGHINC1 and HIGHINC2) are all positive. This means that the presence of these attributes makes for a higher price than that of the base case dwelling. In contrast, the LSHOLD coefficient is negative, suggesting that a dwelling on leasehold tenure would have a lower price than an equivalent dwelling on freehold tenure. These results accord with what would be expected in practice.

We have seen that the coefficients of the variables ROOM4 and ROOM5 are not significant. Since dwelling size should be an important determinant of price, the low t-ratios for the room variables are probably explained by the presence of multicollinearity between the room variables and some of the other variables. In other words, the explanatory power of the room variables has been assumed by other variables. A correlation matrix of the variables in the equation did indeed show a rather high correlation between ROOM4 and MEDINC ($r = 0.46$) and a somewhat lower correlation between ROOM5 and WC2 (0.31). The correlation matrix is given in Appendix 4. It is probably for this reason, too, that ROOM4 and ROOM5 did not qualify for inclusion in the stepwise regression results. An explanation, though speculative, is that beyond a given minimum size of dwelling (say three-roomed), location is more important than size in terms of determining price. Higher income areas in Nairobi are built to lower densities, implying that land values per dwelling are likely to be high relative to construction costs. An additional room, therefore, is not that important since the basic dwelling can be extended at little cost. For this reason, the HIGHINC variables tend to suppress the room variables. This argument would not apply to rental dwellings since a tenant, unlike a house owner, does not have the option of extending the dwelling he occupies. We would therefore predict that room variables would be significant in the regression for rental dwellings.

Turning to the stepwise regression, the results appear satisfactory with the exception that ROOM4, ROOM5 and LSHOLD have been excluded. We have already explored the possible reasons for the exclusion of the room variables.[6] An examination of the intermediate stages of the stepwise regression showed that the selection of variables was in the following order: HIGHINC2;

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[6] The LSHOLD variable was insignificant probably because, on average, the outstanding lease period was long enough to make its benefits comparable to those of freehold tenure.

SQ; WC2; HIGHINC1; MEDINC; DIST10 and ROOM6+. HIGHINC2 alone explains about 80 percent of the price, demonstrating the importance of location in determining price. In other respects there are many similarities between the results of the full regression and the stepwise regression. Both have a high explanatory power as measured by R^2, the standard errors are almost equal and the F ratios are highly significant.[7] To conclude, the three regression equations gave predictions that were within a range of 5 percent. For purposes of prediction, we used the modified full regression.[8]

6.5 Estimated Equations for Rented Dwellings

6.5.1 Estimating Procedure

Here, we made two[9] OLS estimates of the semi-log regression equation discussed earlier, one a full regression containing all the variables and the other a stepwise regression. The equations were fitted using the 1989 rent and dwelling attribute data collected from estate agents. After a first run we excluded four outliers which left us with 101 dwellings. The following results were obtained:

6.5.2 Regression Results

a) Full Regression

Dependent Variable: LOGRENT

Variable	Regression Coefficient	Standard Error	T(DF=90)	Probability	Partial r^2
ROOM4	.2210	.0729	3.032	.00317	.0927
ROOM5	.3475	.0892	3.895	.00019	.1442
ROOM6	.4444	.1402	3.170	.00208	.1004
WC2	.1229	.0572	2.149	.03429	.0488
SQ	.2735	.0592	4.620	.00001	.1917
MEDINC	.2641	.0852	3.100	.00259	.0965
HIGHINC1	.9759	.0973	10.030	.00000	.5278
HIGHINC2	1.4870	.1050	14.166	.00000	.6904
DIST610	-.1194	.0479	-2.492	.01455	.0645
DIST11+	-.0047	.0692	-.068	.94605	5.11585E-05

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[7] The probability values in the analysis of variance tables mean there is nil probability of a spurious relationship between the explained and explanatory variables.

[8] That is, the equation with HIGHINC2 omitted. The equation was used to predict prices in areas other than those covered by HIGHINC2.

[9] As in the case of sold dwellings we made another estimate in which HIGHINC2 was omitted. However, some of the coefficients had the wrong signs and the estimated equation was therefore not used for purposes of prediction.

```
CONSTANT      7.9156

Standard error of estimate = .2001
Adjusted R squared         = .9184
R Squared                  = .9266
Multiple R                 = .9626
```

Analysis of Variance

Source	Sum of squares	DF	Mean Square	F ratio	Probability
Regression	45.4785	10	4.5478	113.553	.000E+00
Residual	3.6045	90	.0401		
Total	49.0830	100			

b) Stepwise Regression

The results shown were obtained after 9 steps. We examine later the sequence in which the variables were selected.

Variable	Regression coefficient	Standard error	F(1, 91)	Probability	Partial r^2
ROOM4	.2206	.0722	9.336	.00295	.0931
ROOM5	.3462	.0867	15.961	.00013	.1492
ROOM6+	.4429	.1377	10.339	.00180	.1020
WC2	.1231	.0568	4.703	.03272	.0491
SQ	.2732	.0588	21.609	.00001	.1919
MEDINC	.2657	.0813	10.686	.00152	.1051
HIGHINC1	.9776	.0932	110.024	.00000	.5473
HIGHINC2	1.4883	.1028	209.610	.00000	.6973
DIST610	-.1179	.0418	7.957	.00588	.0804
Constant	7.9133				

```
Standard error of estimate = .1990

Adjusted R squared         = .9193
R squared                  = .9266
Multiple R                 = .9626
```

Analysis of Variance Table

Source	Sum of squares	DF	Mean square	F ratio	Probability
Regression	45.4783	9	5.0531	127.565	.000E+00
Residual	3.6047	91	.0396		

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Total   49.0830   100

Variable not in equation: DIST11+

6.5.3 Discussion

The results of the full regression and stepwise regression are almost identical. Perhaps the only difference worth mentioning is that the stepwise regression excludes DIST11+, one of the two distance variables. An examination of the intermediate steps of the stepwise regression showed that the selection of variables took the following order: HIGHINC2; HIGHINC1; SQ; WC2; MEDINC; DIST610; ROOM5; ROOM6, and ROOM4. Although this order suggests the ranking of the variables in terms of their ability to explain rent, it is important to remember that a key variable could be relegated to a lower position if it is highly correlated with a variable that has already been selected. For instance, there is a significant correlation between HIGHINC2 and ROOM6+ ($r = .51$)[10] and this probably explains why ROOM6 is not one of the early selections. A correlation matrix of all the variables is given in Appendix 5. HIGHINC2 alone explains 70 percent of the rent and together with HIGHINC1, about 80 percent. This illustrates the importance of the location variables in determining rent.

All the coefficients have the correct signs, negative for DIST610 and DIST11+, but positive for the others. Let us examine the distance variables first. As the location of the base case dwelling is taken to be within 5 kilometres of the city centre, the negative coefficients for these variables suggest that rents decline with distance from the city centre. This outcome is consistent with the result obtained earlier for sold dwellings. The positive signs for the other variables mean that dwellings with the respective attributes command a higher rent than the base case. Earlier, in our discussion of the fitted equation for sold dwellings, we predicted that room variables would be significant in the regression for rental dwellings. The room variables are all significant at the 5 percent level and the hypothesis is therefore supported by our results.

The results of the full regression were used to predict market rents for NHC rented dwellings. It is interesting to note that for rental dwellings, a fourth room implies an additional rent of KSh 680,[11] a fifth room KSh 460,[12] and a sixth about KSh 400.[13] While these absolute values should be treated with caution it is nevertheless instructive to note that they decline with dwelling size, which is what one would expect in reality. In other words, an additional room is less important the larger the dwelling.

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10 This indicates that large dwellings are found in high income areas.
11 Antilog (7.9156 + .2210) - antilog 7.9156.
12 Antilog (7.9156 + .3475) - antilog (7.9156 + .2210)
13 Antilog (7.9156 + .4444) - antilog (7.9156 + .3475)

The comparable results from the equation for sold dwellings are not as systematic but then 2 of the room coefficients were not significant.[14]

6.6 Multicollinearity

Earlier, we highlighted the difficulty posed by multicollinearity among variables and before we present our price and rent predictions, we shall discuss how this problem was dealt with. Where multicollinearity exists, the estimated equation cannot be relied upon to give an accurate explanation of the separate impacts of the predictor variables. As we saw in Chapter 4, however, such an equation can be used for predictive purposes. Even so, predictions should only be for relatively short periods since in the longer-term the exogenous market conditions that determine prices and rents are likely to be unstable (Whitehead and Odling-Smee, 1975; Mark and Goldberg, 1988). What all this implies is that multicollinearity may not be a serious problem for this type of study which adopts a cross-section approach to allocative efficiency.[15] In any event, the worst case of multicollinearity was contained by omitting HIGHINC2 from the list of variables used to estimate the equation for sold dwellings. Furthermore, all coefficients had the correct signs, a feature that accords well with their economic implications.

6.7 Price and Rent Predictions

The estimated full regression equations were used to predict market prices and rents, in 1989, for NHC dwellings in Nairobi.[16] We start with price predictions.

6.7.1 Predictions of Market Price

Predictions of market prices were made for three recent NHC projects in Nairobi. These are owner-occupied schemes at Kibera, Pumwani, and Uhuru Gardens.[17] Taken together, these projects comprise over 85 percent of NHC's recent expenditure[18] on housing construction countrywide. This illustrates the importance of NHC's recent construction programme in Nairobi.

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14 In this regard we did point out that beyond a minimum dwelling size, location seems to take over as the more important variable. A fourth room increases price by about KSh 14000, a fifth room by approximately KSh 9800, and a sixth by nearly KSh 42,000.

15 Our investigation of allocative efficiency is for the year 1989.

16 For sold dwellings, the modified regression was used.

17 These projects also served as case studies in our examination of productive efficiency in Chapter 5.

18 This proportion was calculated from a 1989 project document prepared by the NHC.

6.7.1.1 The Kibera Project (Phase 1)

The first phase of the Kibera project, comprising 980 flats, is located within five kilometres of the city centre. In principle it was meant to accommodate inhabitants from an adjacent slum but in practice this criterion was not applied in allottee selection. The project accounts for almost 70 percent of NHC's recent project expenditures within Nairobi. Our analysis will focus on the 730 three-roomed flats in the project, which were sold at a price of KSh 320,000 each. This price was set administratively[19] and does not appear to take account of the market price for similar dwellings.

The attributes of the flats are:
* seventy percent are three-roomed
* low-income neighbourhood
* located within 5 kilometres of the city centre
* leasehold tenure

The predicted market price, and NHC's selling price are shown in Table 6.1.

Table 6.1 Kibera Phase 1: Predicted Dwelling Price

	KSh per Flat (1989)	
	NHC's Selling Price	Predicted Market Price
	320,000	258,745
Index: Market Price=100	124	100

The price set by the NHC, which disregards the value of land, is nearly 25 percent higher than the predicted market value. On the face of it, therefore, the Kibera flats could not have sold at the price set by the NHC. However, the interest rate offered by the NHC to purchasers, at 7 percent per year, is substantially lower than the market interest rate on mortgage loans, which is 19 percent. In effect, the monthly repayment is significantly less than that for a flat sold at the lower market price, but financed on commercial terms.[20] It is not surprising, therefore, that the NHC was able to sell the flats. A comparison of monthly repayments is shown in Table 6.2.

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[19] It transpired from a discussion held in 1991 with NHC officials that as a result of external pressure, the selling price was based on an early cost estimate which did not reflect the final cost at project completion.

[20] 10 percent downpayment disregarded.

Table 6.2 Kibera Phase 1: Comparison of Monthly Repayments

Selling Price in KSh	Financing Terms	Monthly Repayment in KSh
	NHC Terms	
320,000 (NHC price)	7 % interest; 20 years repayment period	2517
	Commercial Terms	
258,745 (predicted market price)	19 % interest; 20 years repayment period	4227

An alternative approach would be to compare the predicted market price with the present value of the actual payments to the NHC discounted at the current market interest rate of 19 percent. The present value works out as KSh 154,000. This means that the subsidy to a buyer, given by the difference between the predicted market price (KSh 258,745) and the present value of the actual payments (KSh 154,000) is KSh 104,745. So, in spite of the NHC's higher nominal selling price, a substantial subsidy is transferred to the buyer. The decision to borrow could be illustrated as follows. For a dwelling in a cost efficient project, assuming a non-redeemable loan that attracts interest only, the formal annual subsidy S to a buyer can be expressed as:

$$S = p(i-i^*)$$

where p is the amount of loan to the buyer, i is the uniform rate of return on capital and i^* is NHC's lending rate. If the NHC is productively inefficient, the amount of loan[21] will be p^*, where $p^*>p$. The annual equivalent of the extra loan is equal to $i(p^*-p)$. The actual annual subsidy S^* is, therefore, given by:

$$S^* = p(i-i^*) - i(p^*-p)$$

The buyer will borrow as long as $S^*>0$. If we took the NHC lending rate of 6.5 percent and assumed that the uniform rate of return on capital is 15 percent, solving for p^* establishes the

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21 The NHC bases the loan amount on the dwelling cost.

amount that a buyer would, at the limit, be ready to borrow. The buyer would be engaged in a trade-off between NHC's below interest rate and the Corporation's productive inefficiency.

At the limit, $i(p^*-p) = p(i-i^*)$
If we took the value of p to be unity, then,
$0.15p^* - 0.15 = 0.15 - 0.065$
$0.15p^* = 0.235$
$p^* = 1.57$

Bearing in mind the underlying assumptions, this outcome suggests that at the limit, the NHC can sell dwellings whose nominal price is half as much again as the cost efficient price.

6.7.1.2 The Pumwani Project

The Pumwani project is a redevelopment of an existing low-income settlement lying within 10 kilometres of the city centre. It is a tenant-purchase scheme comprised of 284, three-roomed flats. Soon after the project was completed in August 1989, the NHC fixed selling prices at KSh 204,000 per flat. As for Kibera, this amount does not take the value of land into account. The attributes of the Pumwani flats are:

* three-roomed
* low-income neighbourhood
* located within 10 kilometres of the city centre
* leasehold tenure

We have shown in Table 6.3 the predicted market value and the NHC's selling price.

Table 6.3: Pumwani: Predicted Dwelling Price

KSh per Flat (1989)	
NHC's Selling Price	Predicted Market Price
205,000	258,745
Index: 79	100

Market Price = 100

The predicted market price, unlike in Kibera, is higher than the NHC's selling price. A buyer

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would therefore receive an outright subsidy equal to the difference between these two prices. In addition, he would receive a stream of subsidies for as long as the NHC interest rate stays below the market rate. The annual repayment to the Corporation, calculated on the basis of 7 percent interest per year over 20 years is KSh 19,344 and the present value of this stream, assuming a market interest rate of 19 percent is KSh 98,700. This means that the total subsidy to a buyer, given by the difference between the predicted market price (KSh 258,745) and the present value of actual payments (KSh 98,700) is KSh 160,045. With the present value making up only about 40 percent of the predicted market price, it is evident that this project is heavily subsidised.

6.7.1.3 Uhuru Gardens

This is a project located in a medium income neighbourhood within 10 kilometres of the city centre. Unlike dwellings in the other two projects, whose ownership finance was provided by the NHC on concessionary tenant-purchase terms, Uhuru Gardens houses were financed on the basis of commercial mortgage loans.[22] Of the three phases in the project, only phases two and three were sold in 1989, phase one having been built and sold earlier. This study therefore looks only at phases two and three which, together, consist of 170, four-roomed terraced maisonettes. The average[23] selling price was KSh 458,000.

The attributes of the dwellings are:
* four-roomed
* two water closets
* medium income neighbourhood
* located within 10 kilometres of the city centre.
* leasehold tenure

The market price predicted by the estimated regression equation is KSh 573,030.

Table 6.4 shows the predicted market price, and NHC's selling price. Here, again, the predicted market price is higher than the selling price set by the NHC and the buyer would receive an outright subsidy. No stream of interest subsidies would be available to him, however, as long-term finance for this scheme was provided on market terms.

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[22] The Housing Finance Company of Kenya provided most of the long-term loans.
[23] There are minor variations in dwelling area and correspondingly, slight differences in the selling prices.

Table 6.4   Uhuru Gardens: Predicted Dwelling Price

	KSh per Maisonette (1989)	
	NHC's Selling Price	Predicted Market Price
	458,000	573,030
Index: Market Price = 100	80	100

To conclude, it would appear that NHC beneficiaries are treated in one of the following three ways. First, one group of buyers benefits from both price and interest rate subsidies. A second group gets interest rate subsidies but no price subsidies. A third group, consisting of those who buy NHC houses by means of commercial mortgage loans, receives no interest rate subsidies and does not necessarily obtain price subsidies. The inconsistent treatment of beneficiaries appears to be the result of the pricing method applied by the NHC. Pricing is undertaken project by project and, where the Corporation is productively efficient, a buyer is likely to get a price subsidy for two reasons. First, the value of land is not included in the price. Second, the Corporation faces little risk in property development, unlike the private developer. As a result, its price does not include a risk premium. Where the NHC is productively inefficient, a buyer will not necessarily get a price subsidy, the outcome depending on the extent of inefficiency.

6.7.2 Predictions of Market Rent

In Nairobi the NHC owns 4 rental housing estates comprising 156 dwellings. These are Lower Hill flats (64 no.), Kibera rental flats (12 no.), Woodley flats (32 no.) and Sadi Road flats (48 no.). Elsewhere in the country the NHC owns a number of rental projects which it manages, either directly or indirectly, through the provincial civil service. Most of these projects are relatively small, though one estate in Mombasa[24] is comparatively large comprising 700 dwellings. Increasingly, the NHC has moved away from developing rental housing that requires its direct ownership and management, preferring to build houses for sale or for turning over to local authorities. We restrict our predictions of market rents to rental projects within Nairobi. In each case we will also show estimates of market rent given by the Estates Division of the NHC. Such estimates represent an informed opinion of what the market rent should be and are given here for purposes of comparison with the predictions of the fitted equations. Since the dwellings were built

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[24]   This is Kenya's second largest town.

more than 20 years ago, the relationship of rent to capital cost is practically irrelevant and has therefore not been shown.

6.7.2.1 Lower Hill Flats

The attributes of these dwellings are:
* four-roomed
* one water closet
* 24 of the 64 dwellings have servants quarters
* medium income location
* located within 5 kilometres of the town centre.

The monthly rent charged by the NHC in 1989 was KSh 3,000.[25] The predicted market rent for those flats without servants quarters is about KSh 4,450. This figure compares favourably with a market rent estimate of KSh 4,500 given to us by the NHC. For the 24 flats that had servants quarters, the predicted market rent is KSh 5,850. It is apparent, therefore, that the market rent is about 50 percent higher than the rent charged by the NHC in respect to flats without servants quarters and nearly twice as high for those flats with servants quarters.

6.7.2.2 Kibera Rental Flats

The attributes of the dwellings are:
* three-roomed
* one water closet
* low-income neighbourhood
* located between 5 and 10 kilometres of the city centre.

The monthly rent charged by the NHC in 1989 was KSh 1,500. The estimated market rent is KSh 2,430 or about 60 percent higher than the rent charged by the NHC. The estimate of market rent given by the NHC was KSh 2,000.

6.7.2.3 Woodley Flats

The attributes of the flats are:
* three-roomed
* one water closet

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[25] The rent charged does not make any distinction between flats with and without servants quarters.

* medium income neighbourhood
* located between 5 and 10 kilometres of the city centre

The monthly rent charged by the NHC in 1989 was KSh 2,000. The market rent predicted by the estimated equation is KSh 3,170, which is 58 percent higher than the rent charged by the NHC. The Corporation's estimate of market rent was KSh 3,500.

6.7.2.4 Sadi Road Flats

The attributes of these flats are:
* three-roomed
* 1 water closet
* medium income neighbourhood
* located between 5 and 10 kilometres of the city centre

The monthly rent charged by the NHC in 1989 was KSh 2,000. We obtained a predicted market rent of KSh 3,170, which is 58 percent higher than the NHC rent. The estimate of market rent given by the estates section was KSh 3,500. Our main findings on the rental dwellings are brought together in Table 6.5. It will be seen from the table that in each case there are substantial subsidies, given by the difference between the predicted market rent and the actual rent. In general, dwellings in the lower rent categories appear to have higher relative subsidies but lower absolute subsidies.[26]

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[26] Flats at Lower Hill which have servants quarters are an exception.

Table 6.5   Actual and Predicted Rents for NHC Rental Housing

	KSh per Month (1989)		
Project	Actual NHC Rent	Predicted Market Rent	NHC's Estimate of Market Rent
Lower Hill Flats	3,000	4,450 (without servants quarters) 5850 (with servants quarters)	4,500
Index:			
NHC rent=100	100	148 (without servants quarters) 195 (with servants quarters)	150
Kibera Rental Flats	1,500	2,430	2,000
Index:			
NHC rent=100	100	162	133
Woodley Flats	2,000	3,166	3,500
Index:			
NHC rent=100	100	158	175
Sadi Road Flats	2,000	3,166	3,500
Index:			
NHC rent=100	100	158	175

6.8 Rates of Return

In our introduction we said that allocative efficiency could also be investigated by means of rates of return. Here, one would seek to establish the divergence between the market rate of return and the actual return. Again, the implications of this divergence would be investigated assuming, on the one hand, that the market rate of return reflects the long-run equilibrium rate of return and, on the other hand, assuming that it does not. For both rented and sold dwellings we calculated gross rates of return in accordance with the following scheme.

	Rented Dwellings	Sold Dwellings
Actual Rate of Return	Actual Rent per Year/Predicted Capital Value	*
Estimated Market Rate of Return	Predicted Market Rent per Year/Predicted Capital Value	Predicted Market Rent** per Year/Predicted Capital Value

* This cell is empty because for sold dwellings, there is no equivalent of actual rent.
** Imputed Rent

The fitted regression equation for sold dwellings was used to predict capital values for NHC rental dwellings. Conversely, the regression equation for rented dwellings was used to determine imputed market rents for dwellings sold by the NHC. The results are shown in Table 6.6.

6.9 Discussion of Results

In our introduction we hypothesised that the NHC's rents and prices are allocatively inefficient. We also said that we would discuss our findings in the context of two sets of assumptions. The first is that market prices reflect the LRMC of housing provision, whilst the second assumption is that these magnitudes diverge. Our purpose here is to see whether or not our findings support the above hypothesis.

6.9.1 Findings in the Context of an Ideal Market

We start by assuming that the Nairobi housing market is in long-run equilibrium and that, therefore, market prices reflect the LRMC of housing provision. Our results for sold dwellings showed that the predicted market price is lower than the selling price in one case (Kibera Phase 1), but higher in the other two cases (Pumwani and Uhuru Gardens). In all three cases, given the assumptions made, the prices set are allocatively inefficient as they diverge from market prices. In as far as the rental dwellings owned by the NHC are concerned, the predicted market rents are higher than the actual rents by a factor ranging from about 1.6 to 2.0. They, too, are allocatively inefficient.

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Table 6.6   Gross Rates of Return

	Rented Dwellings			Sold Dwellings	
		%			%
Actual Rate of Return	Lower Hill				
	Without SQs*	7.2			
	With SQs	5.4			
	Kibera Rental Flats	6.0			
	Woodley	5.1			
	Sadi Road	5.1			
	Mean	5.7			
Estimated Market Rate of Return	Lower Hill			Kibera Phase 1	12.7
	Without SQs	10.7		Pumwani	12.7
	With SQs	10.5			
	Kibera Rental Flats	9.8		Uhuru Gardens	10.5
	Woodley	8.0			
	Sadi Road	8.0			
	Mean	9.3		Mean	12.1

* SQs = Servants Quarters

Turning to the gross rates of return we see that the actual mean rate of return for rented dwellings, at 5.7 percent, is substantially lower than the predicted mean market rate of return which is 9.3 percent. Indeed, the predicted mean market rate of return for sold dwellings is even higher at 12.1 percent. In theory, gross rates of return for rental dwellings should be higher, reflecting risks perceived by investors to be greater than those associated with owner-occupation. Nonetheless, investors may accept lower rents in anticipation of future capital gains. In practice, on the other hand, rents reflect existing contracts and not current market values (Whitehead and

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Kleinman, 1988). These observations suggest that the gross rates of return for rental dwellings could in fact be higher or lower than those for sold dwellings, the outcome depending on the net effect of the influencing factors mentioned here. In as far as our results are concerned, however, the explanation could lie elsewhere. Our calculation of the mean market rate of return for sold dwellings is heavily influenced by Kibera Phase 1 which is a relatively much larger project than the other two. An error of estimation would, as a result, have a significant impact on the mean. Whatever the reason for the divergence between the rates of return for sold and rented dwellings, the respective figures are substantially higher than the actual rate of return achieved by the NHC. In an ideal regime where market rates of return reflect the long-run equilibrium rate, the NHC would be considered to be allocatively inefficient. We reached the same conclusion earlier, and our findings therefore appear consistent when examined either from the standpoint of absolute levels of prices and rents or from that of gross rates of return. Even so, given that the NHC has social goals to achieve and that it is insulated from risk, there are grounds to justify a rate of return lower than the private return.

6.9.2 Findings in the Context of Disequilibrium

Here, we interpret our results within the context of a market in disequilibrium. In the circumstance, the predicted market prices and rents reflect short-run marginal costs. The absolute difference between actual and market rents, and between actual and market prices is therefore not a good measure of the degree of allocative inefficiency. In other words, since allocative efficiency is assessed relative to the LRMC, divergences from short-run marginal costs are not a suitable measure where a market is in disequilibrium. The rates of return, however, do give better guidance, especially when compared to the 15 percent net rate of return prescribed for state corporations by the Treasury in its Circular Number 1 of 1991. In that circular, however, the Treasury adds that a lower rate of return is acceptable, as long as it can be justified on social grounds. It is assumed here that the Treasury benchmark reflects the long-run return on investments. The NHC's gross rate of return for rental dwellings (5.7 percent) is substantially lower than the net return set by the Treasury. The difference would be bigger still if the comparison were to be made with the NHC's net return.[27]

Overall, the NHC's actual rate of return is well below the Treasury rate but still substantially higher than the average return for public enterprises in Kenya which is about 2 percent.[28] Since the projects discussed here generally do not qualify as low-income projects it is difficult to justify

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[27] For sold dwellings, the gross market rate of return (12.1 percent) was calculated using a numerator that reflected the imputed market rent. As the imputed NHC rent would almost certainly be lower than its market equivalent, this gross rate of return should be adjusted downwards to reflect the rate that the NHC would achieve in practice. A further reduction would again be required to express it in net form.

[28] Figure cited in minutes of a Parastatal Forward Budget Workshop convened by the Ministry of Finance on 5 March, 1986.

the underlying subsidies in distributional terms. For instance, the median wage in Nairobi in 1989 was about KSh 1,500 per month[29] which is indeed lower than the monthly rent or loan repayment for the least expensive dwellings considered in our analysis. Whilst the median household income might have been higher, assuming more than one wage earner per household, it is, nonetheless, apparent that the dwellings discussed here were not affordable to most households. Unless there are other social grounds to justify a relatively low return, the conclusion must be that the NHC is allocatively inefficient. This accords with our initial hypothesis.

6.10 Summary

This chapter set out to investigate the allocative efficiency of the NHC. This was done in the context of two sets of assumptions. The first was that market prices reflect the LRMC of housing provision, and the second that they do not. We started by establishing the extent to which NHC's prices and rents diverge from their market equivalents. To do this we made use of multiple regression analysis. We also investigated gross rates of return on NHC housing.

In the context of an ideal regime we saw that NHC rents and prices are, almost without exception, substantially below market prices. Further, the gross actual rate of return was significantly lower than the gross market rate of return. It appeared, therefore, that under the set of market assumptions made, the NHC was allocatively inefficient. In reality, housing markets are almost invariably in disequilibrium and comparisons between absolute levels of actual prices, on the one hand, and market prices, on the other hand, are not likely to be a good basis for determining allocative efficiency. We therefore compared the NHC's actual rate of return with the benchmark set by the Treasury. We observed that the Treasury rate is substantially higher than the Corporation's actual return. We concluded that the Corporation's pricing is likely to be allocatively inefficient, unless there are social grounds that justify a low rate of return. This conclusion was consistent with our hypothesis.

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[29] Based on data in the Statistical Abstract, 1989.

7. EQUITY

7.1 Introduction

The purpose of this chapter is to examine both vertical and horizontal equity. In our context, vertical equity has to do with the distribution of subsidies among households with different incomes within the same tenure. On the other hand, horizontal equity deals with the distribution of subsidies between households in different tenures but with comparable incomes. We saw in the previous chapter that the NHC owns and manages only a small number of rental dwellings. To investigate equity, therefore, we use the rental housing stock of the Nairobi City Commission (NCC) as a case study.

We start with a background account of the NCC's rental housing stock and the reasons for using it as a case study in our assessment of equity. Next, with 1983 as the year of reference,[1] we estimate subsidies to NCC tenants, as well as their distribution across rent and income levels. Subsidies have been defined as the difference between rents charged by the NCC and market rents of comparable dwellings. Estimates of market rents are obtained by means of multiple regression analysis using the procedure described in the previous chapter. Finally, we discuss the implications that the distribution of subsidies has for both vertical and horizontal equity. Our assessment of vertical equity is based on the distribution of subsidies among NCC tenants and that of horizontal equity on a comparison between subsidies to NCC tenants and to owner-occupiers. Subsidies to owner-occupiers, as we see later, are taken to be equal to the unlevied tax on the imputed rent of owner-occupied dwellings. Since private tenants pay market rents, access to subsidies is also considered.

We test two hypotheses. The first is that subsidies to NCC tenants are regressive. The second is that households in different tenures are treated differently, that is, that subsidies are not tenure-neutral.

7.2 Background

In 1983, Nairobi had a housing stock of 290,000 units, about 65 percent of which were dwellings of permanent construction (RoK, 1986b). Besides NCC rental housing, the other important tenures were private rental housing and owner-occupied dwellings. Overall, private rental housing accounted for about 60 percent of total stock and owner-occupied housing for

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[1]   The use of 1983 as the year of reference was dictated by the availability of data. That year, the Central Bureau of Statistics collected data in 32 towns on dwelling attributes, as well as on household income and other socio-economic information. No comparable survey has been conducted since. In Nairobi, data were collected on a stratified sample consisting of 1300 residential buildings and just over 1100 households. A description of the sampling method is contained in RoK (1986b).

about 30 percent.[2] On the basis of data from the 1983 urban housing survey conducted by the CBS,[3] we estimated that of some 57,000 permanent owner-occupied dwellings, 46,500 were fully owned and the remainder had outstanding mortgage loans.

The stock currently owned and managed by the NCC is substantial, accounting for about ten percent of the permanent housing stock (Mutero, 1988). In 1969, the NCC owned just over 15,000 rental dwellings (Silberman, 1972). This number had increased to about 17,000 by 1975 (HRDU,[4] 1978) and to about 18,000 by 1983 (NCC records). As the NCC has not built new rental housing and no demolitions have been reported, this number has remained unchanged to date. Practically the whole stock has been financed by the NHC, with the NCC acting as developer. Upon project completion, the NCC sets rents in accordance with government policy which is contained in a 1977 report of an inter-ministerial committee (MHSS,[5] 1977). The main requirement is that rents should only be high enough to allow break even on historic costs. Consequently, the rent set for a dwelling is equal to the sum of loan charges, management and maintenance expenses, ground rent, rates, insurance charges and an allowance for bad debts. Rent increases are infrequent and are usually allowed only where it can be demonstrated that management and maintenance charges have grown.

To illustrate the trend of rents for NCC housing stock, we have shown in Table 7.1 rent increases in a typical estate over the period 1960-1983.

It will be seen from that table that between 1960 and 1973, rents rose by an average of 2.0 percent a year. Over the next decade, growth rates ranged from 2.8 percent to 12.2 percent depending on dwelling type. For purposes of comparison, the consumer price index for lower-income groups increased by over 20 percent per year between 1975 and 1984.[6]

Although in the late 1960s the NCC allocated dwellings taking household incomes into account, this allocation criterion is no longer used (Personal discussion with the NCC, 1988); indeed, there does not appear to be any uniform method of allocating dwellings that fall vacant. The rate of tenant turnover is low and over the period 1982 to 1987, only about 130 dwellings a year fell vacant (NCC records) or about 0.7 percent of the total NCC rental housing stock. This low turnover is almost certainly explained by the subsidised rents that the NCC charges, and is an indicator of the limited access to such subsidies.

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2   The remaining 10 percent consisted of NCC dwellings and other publicly-owned dwellings.
3   Central Bureau of Statistics
4   Housing Research and Development Unit of the University of Nairobi.
5   Ministry of Housing and Social Services.
6   Source: 1989 Statistical Abstract.

Table 7.1 Rent Increases: Kariobangi North Estate

	Rents in KSh per Month		
Year	1960	1973	1983
Rent: Dwelling Type A	131	164	210
% Annual Increase		2.0%	2.8%
Rent: Dwelling Type B	86	108	200
% Annual Increase		2.0%	8.5%
Rent: Dwelling Type C	83	104	195
% Annual Increase		2.0%	8.8%
Rent: Dwelling Type D	74	93	175
% Annual Increase		2.0%	8.8%
Rent: Dwelling Type E	50	63	140
% Annual Increase		2.0%	12.2%

Source: NCC Records

In 1987, the waiting list for NCC dwellings grew by about 1,200 applicants (NCC records). Of these applicants, 11 percent were willing to pay rents below Ksh 300 per month, 20 percent Ksh 301-500, 15 percent Ksh 501-800, 13 percent Ksh 801-1,000 and 41 percent over Ksh 1,000 (NCC records). It is instructive to note that the largest number of applicants was interested in dwellings in the highest rental category which, as we see later, receives the highest subsidies per dwelling.

We will conclude this section by setting out the reasons that justify the use of NCC rental housing to investigate equity. First, the Housing Act gives the NHC formal powers to determine the conditions upon which dwellings are let by local authorities. It could be argued, therefore, that in setting rents the NCC acts as an agent of the NHC and, ultimately, of the government. Second, the NHC and the NCC employ similar rent policies, based in each case on the government's policy document referred to earlier. To that extent, the NCC rent structure is a reasonably good reflection of the type of structure the NHC itself would have established. We hypothesize, therefore, that for comparable dwellings, the NCC and NHC would charge rents that are more or less equivalent. This hypothesis will be tested later in the chapter. Third, practically the whole NCC stock has been financed by the NHC. This, however, may not be a particularly important consideration since over 80 percent of the stock is more than 20 years old. Given that loan

charges reflect historic costs, the recurrent amounts paid to redeem loans older than 20 years are too small to be of much relevance to the level of current rents. The latter are likely to be influenced more by management and maintenance expenses.

7.3 Estimation of Subsidies

Subsidies to NCC rental housing have been defined as the difference between market rents and the actual rents charged by the NCC. No account has been taken in our calculations of the price for housing services that would prevail in an unsubsidised market. In an ideal market, as we saw in Chapter 4, the subsidy would be given by the difference between the equilibrium rent and the actual rent. In empirical work, however, it is customary to use the market rent instead of the equilibrium rent. The basic estimation problem is then one of determining the market rent for subsidised housing and here, we have repeated the procedure followed in Chapter 6. Thus, we have estimated a semi-log multiple regression equation by regressing rents for private dwellings on their attributes. Second, we have used the fitted equation to predict market rents for NCC rental dwellings. These steps will now be described in detail, starting with a description of the data used to estimate the regression equation.

7.4 Data

The regression equation was estimated using Nairobi data from the 1983 urban housing survey conducted by the CBS. Two types of data were used. The first comprised household incomes and expenditures, from which we estimated the mean incomes for the various income classes. The second type consisted of dwelling attributes. We discuss the income data first.

The urban housing survey did not record the actual values of household incomes. Instead, it recorded the income classes within which households fell, as well as actual household expenditures. The income classes used, in KSh per month, were: under 500; 501-1,000; 1,001-2,000; 2,001-4,000; 4,001-6,000; 6,001-8,000; 8,001-10,000; 10,001-20,000; over 20,000.

The CBS adopted this approach to gathering household income data in order to avoid the difficulties that are usually encountered in obtaining precise income figures from households. Its drawback, however, is that mean household incomes cannot be calculated directly from the grouped data. As this statistic is needed in our calculations of subsidy distribution, we have assumed that for the first three income classes, the mean household expenditure for each class is a good estimate of the mean household income. This is a reasonable assumption only in so far as low-income groups spend most of their income. For the remaining income classes, the mean expenditure is either very close to or less than the lower bound of the respective income class.

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This is probably a reflection of underreporting, as well as of the fact that not all income is spent. The mean expenditure is therefore not a good estimate of the mean income as, Table 7.2 below shows.

Table 7.2 Nairobi: Income Classes and Household Expenditure in 1983

	Income Class	KSh per Month	Mean Household Expenditure
1.	under	500	480
2.	501 -	1,000	720
3.	1,001 -	2,000	1,200
4.	2,001 -	4,000	2,300
5.	4,001 -	6,000	3,560
6.	6,001 -	8,000	4,690
7.	8,001 -	10,000	5,910
8.	10,001 -	20,000	6,730
9.	over	20,000	8,800

Source: Urban Housing Survey, 1983

For the fourth to eighth income classes, we assumed that the mid-point value is a reliable estimate of the mean household income; and for the ninth class, whose upper bound is unknown, we used the arbitrary mean value of KSh 25,000. Estimates of the mean household incomes for all classes are given in Table 7.3. There, we have also shown the number of CBS survey households in each class. It will be seen that the first four income classes account for nearly 80 percent of the sample population. No NCC tenant households in the survey sample, however, fell within the first income class.

We now turn to dwelling attributes, the second type of data used. The dwellings in the CBS survey varied enormously in quality. At the one extreme were mud and wattle dwellings without access to basic services. At the other extreme were dwellings built of permanent materials, with connections to water and electricity. We selected dwellings that met three criteria. The first was that all dwellings should be of permanent construction. The second required that they have water-borne sanitation. The third was that complete information should be available on the attributes to be included in the regression equation. We restricted our selection to permanent dwellings that had water-borne sanitation in order to ensure comparability with NCC dwellings which, with a few exceptions, have similar characteristics. The main shortcomings of the data were that information on location was not available and only 58 dwellings met the criteria listed here. Our findings may therefore not be as robust as would have been the case had data on location and a

larger sample been forthcoming.

Table 7.3 **Nairobi**: Income Classes and Mean Household Incomes in 1983

	KSh per Month		
Income Classes	Mean Household Income	No. of Households in CBS survey	%
1. under 500	480	120	10.5
2. 501 - 1,000	720	283	24.9
3. 1,001 - 2,000	1,200	322	28.3
4. 2,001 - 4,000	3,000	182	16.0
5. 4,001 - 6,000	5,000	85	7.5
6. 6,001 - 8,000	7,000	46	4.0
7. 8,001 - 10,000	9,000	34	3.0
8.10,001 - 20,000	15,000	41	3.6
9. Over 20,000	25,000	25	2.2
Total/ Mean -	3,604	1,138	100.0

7.4.1 The Dummy Variables

The dummy variables for the regression equation to be estimated were specified as follows:

RM2 = 1 if dwelling has 2 rooms, 0 otherwise

RM3 = 1 if dwelling has 3 rooms, 0 otherwise

RM4 = 1 if dwelling has 4 rooms, 0 otherwise

RM5 = 1 if dwelling has 5 rooms, 0 otherwise

TOILET = 1 if dwelling has a private toilet, 0 otherwise

COMBATH = 1 if dwelling has a communal bath, 0 otherwise

HOTWAT = 1 if dwelling has a hot water system, 0 otherwise

KITCHEN = 1 if dwelling has a private kitchen, 0 otherwise

PRIVBATH = 1 if dwelling has a private bath, 0 otherwise

ELECTRIC = 1 if dwelling has an electricity connection,
0 otherwise

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SQ = 1 if dwelling has servants quarters, 0 otherwise.

7.4.2 The First Estimate

We estimated a multiple regression equation in which the logarithm of rent for private dwellings was regressed on dwelling attributes. Following a preliminary computer run, the error terms for six of the dwellings were identified as "outliers". The dwellings were therefore excluded from the computations that followed. We followed the stepwise method described in Snedecor and Cochran (1980) and selected an F ratio of 2 for the inclusion of individual regressors in the equation and a similar value for exclusion. The first computer run produced the following results:

<u>First Regression Equation</u>

Variable	Regression Coefficient	Standard Error	F Ratio
RM2	0.3636	0.0866	17.609
RM3	0.9692	0.1038	87.202
RM4	1.3202	0.0993	176.861
RM5	1.4393	0.1298	123.004
TOILET	0.4959	0.1217	16.602
COMBATH	0.3177	0.1195	7.068
HOTWAT	0.1313	0.0612	4.603
KITCHEN	-0.2674	0.1528	3.063
SQ	0.7034	0.0652	116.236

PRIVBATH = Excluded
ELECTRIC = Excluded
Intercept = 5.8692
Standard error of estimate = 0.1535
Adjusted R squared =   0.96
R squared   =   0.97
F Ratio   = 147.97

All the coefficients with the exception of that for KITCHEN (private kitchen) have the expected signs. The intercept 5.8692, whose antilogarithm is 354 means that the rent for the base case dwelling (i.e. a one-roomed dwelling without the attributes represented by the dummy variables) is Ksh 354 per month.

The exclusion of the variable PRIVBATH, upon its failure to pass the F test set for the inclusion of variables in the equation (i.e. F=2), was not considered a serious drawback to the reliability of the fitted equation. Private baths are usually found together with private toilets and the variable TOILET may therefore be expected to act as a reliable proxy for the two attributes.

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Indeed, as the correlation matrix in Appendix 6 shows, the correlation coefficient for these two variables is very high (r = 0.95). The exclusion of the variable ELECTRIC suggests that in lower-income housing, electricity is not considered to be particularly important.

The negative coefficient for the private kitchen implies that a base case dwelling with a kitchen would rent for Ksh 270.[7] This is not a logical outcome, since the addition of a private kitchen should raise rent. We therefore omitted the variable KITCHEN from the regression equation. Whilst multicollinearity among some of the explanatory variables was significant (see Appendix 6), the primary purpose of the estimated equation was prediction and not establishing the relative worth of respective variables.

7.4.3 The Second Estimate

A second run of the regression equation was carried out with the variable KITCHEN omitted. The following results were obtained.[8]

Second Regression Equation

Variable	Coefficient	Standard Error	F Ratio
RM2	0.3457	0.0881	15.403
RM3	0.8577	0.0839	104.548
RM4	1.2314	0.0873	198.815
RM5	1.3396	0.1194	125.938
TOILET	0.3259	0.0751	18.833
COMBATH	0.3334	0.1220	7.471
HOTWAT	0.1536	0.0613	6.277
SQ	0.7055	0.0668	111.607

PRIVBATH = Excluded
ELECTRIC = Excluded
Intercept = 5.8482
Standard error of estimate = 0.1571
Adjusted R squared = 0.96
R squared = 0.97
F Ratio = 158.48

The second equation is similar to the first, with the important exception that all the coefficients have the expected sign. The adjusted R^2, at 0.96, means that 96 percent of the

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[7] Antilogarithm (5.8692 - 0.2674).
[8] With 8 variables in the equation, there were 43 residual degrees of freedom.

change in the response variable, rent, is explained by changes in the attributes included in the equation. The standard errors of the coefficients are relatively small and the F ratios are in every case greater than the critical values at the 5 percent significance level.[9] The predicted market rent for a one-roomed dwelling is Ksh 345 per month,[10] somewhat lower than that given by the first equation. In either case, the prediction seems to be a reasonable estimate of the actual rent for a typical one-roomed dwelling in a low-income area (RoK, 1986b). In order to facilitate interpretation, the antilogarithms of the sum of the intercept (base case) and each of the coefficients are set out below.

Variable	Coefficient	Intercept	Sum of intercept and coefficient (Natural Logarithm)	Antilogarithm
Col.1	2	3	4	5
RM2	0.3457	5.8482	6.1939	490
RM3	0.8577	5.8482	6.7059	817
RM4	1.2314	5.8482	7.0796	1,187
RM5	1.3396	5.8482	7.1878	1,323
TOILET	0.3259	5.8482	6.1741	480
COMBATH	0.3334	5.8482	6.1816	484
HOTWAT	0.1536	5.8482	6.0018	404
SQ	0.7055	5.8482	6.5537	702

Each of the coefficients measures the change in rent, relative to the base case, brought about by a change in one of the explanatory variables when all other variables are held constant. For ease of exposition, we have shown the sum of the intercept (base case) and each of the coefficients (column 4); and therefore the values in column 5 are interpreted as follows:

Rent for a two-roomed dwelling: Ksh 490 per month
Rent for a three-roomed dwelling: Ksh 817 per month
Rent for a four-roomed dwelling: Ksh 1,187 per month
Rent for a five-roomed dwelling: Ksh 1,323 per month

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[9]   The critical value of the F ratio is about 2.2
[10] Antilogarithm 5.8482.

Rent for a one-roomed dwelling with a private toilet: Ksh 480

Rent for a one-roomed dwelling with a communal bath: Ksh 484

Rent for a one-roomed dwelling with a hot water system: Ksh 404

Rent for a one-roomed dwelling with servants quarters: Ksh 702

The second room increases the rent by Ksh 145 (i.e. 490-345), the third by Ksh 327 (i.e. 817-490), the fourth by Ksh 370 (i.e. 1,187-817) and the fifth by Ksh 136 (i.e. 1,323-1,187). These results appear plausible, although we would expect the marginal rent for the second room to have the highest value on the grounds that marginal utility should decline with the number of rooms in a dwelling. In practice, one- and two-roomed dwellings are usually found in low-income areas, and larger dwellings in higher income areas. It is likely therefore that the RM2 variable measures the addition to rent by a second room in low-income areas and RM3, the addition to rent by a third room in higher income areas. This probably explains the lower marginal value for the second room. The results are also reassuring in that the marginal rental value of the fifth room is lower than that of the fourth room. A private toilet increases the rent by Ksh 135 (i.e. 480-345), a communal bath by Ksh 139 (i.e. 484-345), a hot water system by Ksh 59 (i.e. 404-345) and servants quarters by Ksh 357 (i.e. 702-345). These estimates appear realistic with the exception that we would expect a private toilet to contribute more to rent than a communal bath.

7.5 Predicted Market Rents

The second regression equation was used to predict market rents for NCC rental dwellings. First, predictions were made for 94 dwellings drawn from the 1983 urban housing survey, for which data were available on dwelling attributes, as well as on household incomes. Second, predictions were made for about 15,700 dwellings in 30 NCC housing estates, for which information was available on dwelling attributes, but not on household incomes. These dwellings comprise 85 percent of the NCC's total rental housing stock. We now turn to an examination of the predicted rents and estimated subsidies.

7.5.1 The Survey Dwellings

Of the 94 NCC dwellings drawn from the urban housing survey, 46 were let for KSh 120 per month, 32 for KSh 250 and the remaining 16 for rents ranging from KSh 400 to 450. They consisted of one- and two-roomed units and those let for higher rents had access to better bathing and sanitation facilities. The survey sample was not representative of NCC rental housing in that it did not include dwellings in higher rent brackets. Moreover, the incomes of the tenant households were confined to the lower income groups. Thirteen households had a mean income of KSh 720 per month, sixty five KSh 1,200 and the remaining sixteen KSh 2,000. We have already

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discussed how mean household incomes were estimated. The bias in the sample of dwellings did not allow us to draw from the survey data, conclusions that could be applied to the whole range of household incomes and rent levels for NCC tenants. We return to this question in the next part of our analysis where data on a wider spectrum of NCC housing are examined. We used the second regression equation to predict market rents for the 94 NCC dwellings. The results are given in Table 7.4 below.

Table 7.4   NCC Rental Housing: Comparison between Mean
               Actual Rents and Mean Market Rents for Three
               Lower Income Groups in 1983

		Income and rent figures in KSh per month		
Mean Household Income	No of Units	Mean Actual Rent	Estimate of Mean Market Rent	Mean Actual Rent as a percentage of Mean Market Rent
720	13	177	384	46.1
1,200	65	236	475	49.7
3,000	16	185	413	44.7
Total/ 1,440 Mean	94	219	452	48.5

It will be seen that the three income groups paid rents that were less than a half of the estimated market rent; and the mean actual rent expressed as a percentage of the mean market rent was lowest (44.7 percent) for the households with the highest mean income (Ksh 3,000) and highest (49.7) for those with mean incomes of Ksh 1,200. It is clear, therefore, that tenants benefitted from substantial subsidies with those in the intermediate income class receiving the largest mean subsidy in absolute terms. It is interesting to note that the mean actual rent for households in the highest income class was lower than that for households in the middle income group. While this outcome may not be entirely reliable, given our small sample, it is consistent with the NCC's practice of not taking household income into account in dwelling allocations.

Having shown that the three categories of NCC dwellings are let for amounts substantially below the market rent, we now turn to the distribution of the underlying subsidies with respect to

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income. This will allow us to make tentative conclusions on whether or not the distribution of subsidies is equitable. Subsidies are said to be progressive if the ratio of subsidy to income falls as income rises and a more detailed discussion of this aspect is contained in Mutero (1988). We will examine the relationship between income on the one hand, and changes in the ratio of subsidy to income, on the other hand. This relationship is illustrated by the figures in Table 7.5 below.

Table 7.5   NCC Rental Housing: Test for Progressivity of
            Subsidies in 1983

Income and Subsidy Figures in KSh per Month		
Mean Household Income	Mean Subsidy	Ratio of Subsidy to Income
720	207	0.29
1200	239	0.20
3000	228	0.08

It will be seen that the ratio of subsidy to income falls as income rises and for this reason the distribution of subsidies is progressive. We should underline, however, that this conclusion is based on an analysis of subsidies to only three income groups and could be misleading. Another way to approach the question of progressivity, is to compare the distribution of subsidies with that of income. Table 7.6 shows the distribution of subsidies and income for the 94 tenant households. The figures in that table show that the lowest income group accounted for 6.9 percent of the total income but for nearly twice as large a share of the total subsidies (12.3 percent). The next income group also received a relatively higher share of total subsidies (71.0 percent) than of total income (57.6 percent). Only at the highest income level were these relative shares reversed. It is evident, on the basis of these comparisons, that the distribution of subsidies was less unequal than that of income.

We said earlier that the 94 dwellings in the survey were not representative of NCC dwellings and that for this reason, only conclusions of limited application could be drawn from this part of our analysis. In order to arrive at conclusions of wider application we turn to an examination of subsidies to the whole range of NCC rental dwellings.

Table 7.6 NCC Rental Housing: Distribution of Subsidies
           and Income in 1983

Income and Subsidy Figures in KSh per Month					
Mean Household Income	No of Households	Distribution of Total Income	%	Distribution of Total Subsidy	%
Col. 1	2	3	4	5	6
720	13	9,360	6.9	2,691	12.3
1,200	65	78,000	57.6	15,535	71.0
3,000	16	48,000	35.5	3,648	16.7
Total/ Mean 1,440	94	135,360	100.0	21,874	100.0

7.5.2 Subsidies to NCC's Rental Housing Stock

Here, we analyse the distribution of subsidies to 15,700 rental dwellings in about 30 housing estates, comprising nearly 85 percent of the NCC's rental housing stock. Our analysis is based on data for 1983 on dwelling attributes and actual rents. With a few exceptions, each NCC housing estate is comprised of dwellings of identical architectural design. Only where designs varied was it necessary to record attributes of more than one dwelling. We used the second regression equation to estimate market rents for the 15,700 dwellings. In Table 7.7 we have shown the distribution of subsidies by rent and the ratio of mean subsidy to mean rent. The table shows that in 1983 there was a virtual polarisation of NCC housing by rent classes, with the first two classes comprising about 12,370 dwellings (80 percent) and the last two 3,215 dwellings (20 percent). The middle rent class consisted of only 150 units. This feature of the NCC housing stock probably reflects changes in past housing policy. The dwellings in the first two categories were built mainly in the 1950's, in the pre-independence period. They consist largely of one-roomed units designed to accommodate single person households.[11] Some of the higher rent dwellings

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[11] In 1962 for instance, nearly 80 percent of the housing stock in Nairobi consisted of one-roomed dwellings (Bloomberg et al., 1965).

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were built in the 1960's and 1970's.[12] They comprise dwellings of at least two rooms each and were meant to accommodate larger households.

Table 7.7   NCC Rental Housing: Distribution of
             Subsidies by Rent

		Rent and Subsidy Figures in Ksh per month				
Rent Classes (By Actual Rent)	No of Units	%	Mean Actual Rent	Mean Market Rent	Mean Subsidy	Ratio of Mean Subsidy to Mean rent
Up to 100	7,467	47.4	58	479	421	7.3
101- 400	4,904	31.2	121	493	372	3.1
401- 700	1,501	1.0	514	840	326	0.6
701-1,000	2,727	17.3	867	1,553	686	0.8
1,001-1,500	488	3.1	1,239	2,424	1,185	1.0
Total/ Mean	15,736	100.0	259	733	474	0.6

Turning to vertical equity, the table shows that after a modest decline over the first three rent categories, the absolute mean subsidy increased almost four-fold over the last three. It is difficult, without some knowledge of the distribution of incomes among the tenant households, to draw unambiguous conclusions on whether or not the distribution of subsidies was progressive. We could, however, make tentative conclusions if we assumed that in general, tenants in higher-rent dwellings had higher incomes than tenants in lower-rent dwellings. Although this relationship was not borne out by our earlier analysis of 94 dwellings drawn from the CBS urban housing survey, it is supported by data covering a broad range of rent levels given in Silberman (1972). We could therefore use the subsidy to rent ratio as a proxy for the subsidy to income ratio. Table 7.7 shows that the subsidy to rent ratio falls across the lower rent categories and rises across the top two.

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[12] Commenting on the quality in 1964 of the NCC rental housing stock, Bloomberg et al. said "the standards and designs are diverse, including poor projects of earlier days to better arrangements when capital and experience permitted it" (Bloomberg et al., 1965 p.9).

This suggests that subsidies are distributed equitably at lower levels of income but inequitably at higher levels.

One reason we gave for using the NCC's rental stock to study equity issues was that the NCC and NHC employ similar rent policies. We went on to hypothesize that for comparable dwellings, the NCC and NHC would charge rents that were more or less equivalent. In Table 7.8 we have compared the rents charged by the two organizations for their respective rental dwellings. Since NHC dwellings are apparently of higher quality than the typical NCC dwelling, we have selected only those NCC dwellings that fall within the three highest rent classes shown in Table 7.7. This approach, which restricts comparisons to a narrower band of dwelling quality, should yield more meaningful results..

Table 7.8 Comparison between NHC and NCC Rent and Subsidy Structures. Amounts in KSh.

	Actual Rent	Estimated Market Rent	Actual Rent as a % of Market Rent
NCC Dwellings	514	840	61
Base Year=1983	867	1553	56
	1239	2424	51
NHC Dwellings			
Base Year=1989			
Lower Hill Flats	3000	4450	67
		5850*	51
Kibera Rental	1500	2430	62
Woodley Flats	2000	3166	63
Sadi Road	2000	3166	63

* Dwellings with servants quarters

The table shows that for both organizations, actual rents relative to market rents are not particularly dissimilar. This suggests that the NCC rent and subsidy structure is a reasonable reflection of the type of structure that the NHC would itself have established, an outcome that supports our earlier hypothesis. It should be pointed out, however, that the rent data for NCC and NHC dwellings refer to 1983 and 1989, respectively. Correspondingly, the multiple regression equations that were used to predict market rents were fitted with 1983 and 1989 data on private rents. The use of different base years probably introduces some bias into our results. Since NCC rents are not raised frequently, it is likely that between 1983 and 1989 they would have tended to

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fall relative to market rents. If the NCC percentages in the table were adjusted to take this into account, in effect making 1989 the common base year, the relative difference between NCC and NHC rents would probably rise. In the circumstance, the NCC rent structure could turn out to be substantially different from that of the NHC. The NCC did, however, raise its rents in 1987,[13] and perhaps only a minor adjustment would be necessary to ensure parity between the two base years. Consequently, our comparisons may not be unreasonable in spite of the use of different base years.

7.6 Horizontal Equity

So far, our analysis has focused on aspects of vertical equity. To assess horizontal equity, it is necessary to compare rental housing with other tenures. Private tenants are not subsidized and our comparison will, in the first instance, be restricted to NCC tenants and owner-occupiers. Later, in considering access to subsidies, we will take private tenants into account. As we saw in an earlier study (Mutero, 1988), subsidies to owner-occupiers can be defined in two ways, depending on how housing is viewed in economic terms. If housing is viewed as an investment good, subsidies are then said to comprise tax exemptions enjoyed by owner-occupiers but not by holders of other assets, including landlords (Grey et al., 1981; Robinson, 1981). An example is tax on imputed rent. In Kenya, landlords and other investors pay tax on their investment income but owner-occupiers are not taxed on the imputed rent of their dwellings. In the circumstance, the subsidy to owner-occupiers is taken to be equal to the unpaid tax on imputed rent. This tax benefit is a measure of the preferential treatment accorded to owner-occupiers relative to other investors. As a capital gains tax is not levied in Kenya, owner-occupiers and other investors receive equivalent tax treatment.

On the other hand, if housing were to be viewed as a consumption good, the nature of the subsidy changes. Tax relief on mortgage interest now becomes the measure of subsidy, as no equivalent relief exists on other consumption goods. In this context, tax relief measures the preferential treatment over other consumers that the owner-occupier enjoys in his capacity as a consumer. Following Grey et al. (1981), we have assumed that society values investment more than consumption and have consequently adopted the first definition of subsidy.

Since a market for owner-occupied dwellings exists, a distinction should be made between the formal and actual incidence of subsidies. Formal incidence is concerned with the direct recipients of a subsidy, and actual incidence with those who ultimately benefit from it (Kay and King, 1986). Unlike formal incidence which, in the present context, would assume that subsidies are equal to the tax benefit, actual incidence is different in that it takes account of the extent to which

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[13] NCC records.

future subsidies are anticipated by sellers and as a result capitalised into current prices. The degree to which sellers can do so depends on the price elasticity of supply. Where the supply of dwellings is elastic, the extent of capitalisation is low, but it rises as the elasticity of supply declines. It also matters whether we are considering the short-run or the long-run. In the short-run, market adjustments are limited and for that reason, an upward shift in housing demand mainly leads to price increases. In the long-run, on the other hand, the market is able to adjust and prices tend fall as more dwellings are produced. The divergence between formal and actual incidence depends, therefore, not only on the price elasticity of supply, but also on the market period in question. In empirical work it is customary to use formal subsidies for purposes of comparison, given the intractability of determining actual incidence (Robinson, 1981).

To estimate formal subsidies to owner-occupiers[14] we used the following procedure. First, the multiple regression equation fitted earlier was used to predict the gross imputed rent for 104 owner-occupied dwellings selected from the 1983 urban housing survey already referred to. These are the dwellings on which complete information was available both on incomes of owners and on dwelling attributes. Second, in order to obtain the net imputed rent, we deducted those costs that are normally borne by the owner-occupier. These are management and maintenance expenses, NCC rates, and ground rent. These outgoings amount to about 15 percent of the gross rent. Financial charges, however, were not deducted since the formal subsidy to an owner-occupier is independent of whether or not he has an outstanding mortgage loan (Rosenthal, 1975). Third, to obtain estimates of formal subsidy, we applied 1983 taxation rates to the net imputed rent. Our results are set out in Table 7.9. As the table shows, the absolute subsidy increases throughout with both income and imputed rent. We are going to use this information to make inter-tenure comparisons.

7.7 Inter-tenure Comparisons

Table 7.10 sets out formal subsidies to owner-occupied dwellings and NCC rental housing for the three income groups on which information was available for both tenures. These income groups comprised about 70 percent of the households in the 1983 urban housing survey.

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[14] The subsidy to both outright owners and mortgagors is equal (Rosenthal, 1975), and is given by the expression: $s = ipt$, where i is the uniform rate of return on capital, p is the capital value of the dwelling and t the rate of taxation.

Table 7.9   Owner-occupiers: Distribution of Subsidies in 1983.

Income and Subsidy Figures in KSh per Month

Mean Household Income	No. of Dwellings drawn from CBS Survey	Net Imputed Mean Rent	Mean Subsidy
720	4	496	50
1,200	10	870	87
3,000	20	1,363	204
5,000	16	1,615	389
7,000	16	2,157	690
9,000	16	2,764	1,129
15,000	15	2,596	1,543
25,000	7	2,871	1,866
Mean	–	1,938	737

Table 7.10   Subsidies to Owner-occupiers and NCC Tenants

Income and Subsidy Figures in KSh per Month

Mean Household Income	Mean Subsidy	
	Owner-occupiers	NCC Tenants
720	50	207
1,200	87	239
3,000	204	228

It will be seen that for the first two income groups, subsidies to NCC tenants are three to four times as high as subsidies to owner-occupiers; for the highest income group, the difference is small. It is also interesting to compare the range of subsidies to owner-occupiers and NCC tenants. For owner-occupiers, the monthly subsidy ranges from KSh 50 to slightly below KSh 2,000 (see Table 7.9), and for NCC tenants from about KSh 420 to nearly KSh 1,200 (see Table 7.7). This shows that whereas lower-income owner-occupiers receive much smaller formal

subsidies than NCC tenants with equivalent incomes, the position reverses itself at higher income levels. The mean subsidy to owner-occupiers is about KSh 740 (see Table 7.9), over half as much again as the mean subsidy to NCC tenants (see Table 7.7). These results are consistent with our second hypothesis that subsidies are not tenure-neutral.

7.8 Access to Subsidies

Up to this point, our analysis has dwelt on two main aspects of subsidies. The first is the distribution of subsidies within the NCC's rental tenure. The second is a comparison between subsidies to NCC tenants and to owner-occupiers. Besides NCC and owner-occupied housing are private dwellings which, as we pointed out earlier, make up about 60 percent of the housing stock. Private tenants pay market rents and are therefore not subsidised. Indeed, the poorest households live in slum areas which lack basic infrastructure services. About 35 percent of all dwellings are located in such areas (RoK, 1986b). These figures demonstrate that a substantial proportion of households do not have access to subsidies. Access is impaired not only as a result of the limited number of NHC and NCC dwellings, but also because many of these houses may not be affordable by a majority of households living in slum areas. There is therefore no horizontal equity across the three main tenures. This outcome can be generalised beyond the context of Nairobi to other towns in which the NHC has financed local authority housing.

7.9 Summary

This chapter set out to investigate vertical and horizontal equity in the context of NCC rental housing and owner-occupied dwellings. Although neither owned nor directly managed by the National Housing Corporation, NCC rental housing was selected for study for a number of reasons. First, the NHC has formal powers to determine the conditions upon which dwellings are let by local authorities. Second, the NHC and NCC employ similar rent policies. Third, the NCC's housing has been financed almost entirely by the NHC, though where the stock is old this may not be a particularly relevant consideration.

Our investigation of vertical equity was based on the distribution of subsidies among NCC tenants and that of horizontal equity on a comparison between subsidies to NCC tenants and to owner-occupiers.

Our analysis proceeded as follows. First we estimated subsidies to NCC rental housing in 1983. Given that rents for NCC dwellings are set administratively, the problem we faced was one of estimating the likely levels of market rents. We defined subsidies to tenants as the difference between the estimated market rents and the actual rents charged by the NCC; and no account was

taken of the effect of a controlled housing sector on rents in the uncontrolled private market. A regression equation was fitted by regressing the market rents for private dwellings on the attributes of those dwellings. This equation was used to estimate market rents for NCC dwellings. First, estimates were made for 94 dwellings covered by the 1983 urban housing survey. From the results, we worked out the distribution of subsidies by household income and concluded that for the 94 dwellings, the distribution of subsidies was progressive. We noted, however, that these dwellings were not entirely representative of all the NCC's rental dwellings. As a second step, therefore, we estimated subsidies to about 15,700 dwellings, comprising 85 percent of the NCC's total rental housing stock. Although data on household income were not available, using rent paid as a proxy for income, we were able to draw the tentative conclusion that there was vertical equity at lower income levels but vertical inequity at higher incomes. Our hypothesis that subsidies are regressive was therefore supported only partially by the evidence.

Formal subsidies to owner-occupiers were defined as the tax on the imputed rent of dwellings occupied. The already fitted regression equation was used to predict market rents for 104 owner-occupied dwellings, on the basis of which estimates of subsidy were obtained. Inter-tenure comparisons showed that there was no horizontal equity between NCC rental housing and owner-occupied dwellings; nor was there horizontal equity between these two tenures and private rental housing, whose tenants have little access to subsidies. These findings were consistent with the hypothesis that subsidies are not tenure-neutral.

Overall, the analysis conducted shows that there are important divergences between outcomes and the NHC's social objective of ensuring the equitable distribution of subsidies. In the main, differences are brought about by the use of inappropriate procedures to allocate publicly financed housing, limited access to subsidies by private tenants, and the government's tax treatment of owner-occupied housing.

8. PERFORMANCE EVALUATION

8.1 Introduction

The purpose of this chapter is to evaluate the performance of the NHC using, on the one hand, indicators that examine the effectiveness of the Corporation in meeting development plan targets and, on the other hand, indicators that focus on management efficiency. The justification for this type of evaluation was given in Chapter 3 and the performance indicators to be employed were discussed in Chapter 4.

We start with an examination of the Corporation's effectiveness. First, we look at the trend of housing production and average costs relative to development plan targets. Second, we examine dwelling costs relative to earnings, again making comparisons between outcomes and development plans. Third, we assess the ability of the management to transfer to beneficiaries all the subsidies implicit in government loans and land, subject to breakeven on the basis of historic costs. Next we investigate the efficiency of management in reference to its ability to meet project budgets in terms of time and cost; to break even; to contain operating costs, and to recover loans. This type of investigation allows an overall judgement to be made of the extent to which the NHC has been able to meet its main objectives, both immediate and social.

8.2 NHC's Effectiveness in Programme Implementation

We said in Chapter 2 that in the various development plans, goals are set for the NHC in terms of the number of dwellings to be produced and their cost levels. Moreover, the plans give estimates of the financial resources required to meet such goals. Our purpose here is to establish the extent to which the NHC has been able to meet these goals. We will employ the performance indicators set out in the chapter on research method (Chapter 4). To recapitulate, the first indicator is the absolute number of units produced, an indicator which derives its importance from the numerical shortage of dwellings in Kenyan towns. A second indicator is the average cost per dwelling, an important measure of performance since unit cost not only affects affordability but also determines the total number of dwellings that can be built for a given financial outlay. As we pointed out in Chapter 2, the Corporation's overriding aim is to produce dwellings that are affordable by lower-income groups. Third, will be the ratio of average cost to the median wage per year. This, again, is an indicator of affordability; the higher the ratio, the more difficult it is for households to afford the dwellings produced. These indicators are shown in Table 8.1 for the period 1970-1988.

Table 8.1 NHC: Comparison between Output and Development
          Plan Targets

| | Amounts in Kenyan £ | | | | | | |
| | Actual NHC Output | | | | Development Plan Targets | | |
	No.of Units	Actual Budget	Aver-age *Cost*	Ratio of Aver-age Cost to Median Wage	No.of Units	Planned Budget	Aver-age *Cost*	Ratio of Average Cost to Median Wage
1970-74	12200	10697	877	3.7	24400*	10970	450	1.9
1974-78	8240	13462	1634	4.7	60000	24110	400	1.1
1979-83	13390	22780	1700	2.5	47300**	31023	655	1.0
1984-88	4300	16415	3817	4.7	36000	22040	610	0.8

Sources: NHC 1986/87 Annual Report; NHC records; Various
   Development Plans, and Statistical Abstracts.
* The specific number of dwelling units is not shown in the plan.
   This figure has been obtained by dividing the planned
   expenditure by the expenditure per unit assumed in the plan,
   of approximately Kenyan £ 450.
** This includes 26500 site and service, and upgrading units
   in Nairobi, Mombasa, and Kisumu, the towns covered by
   a World Bank supported project (Urban 2).

The table[1] shows substantial differences between NHC output and development plan targets.
Overall, with the exception of the 1970-74 plan period, the output projected in the development
plans has exceeded by far the value of projects completed by the Corporation. The disparity
between the housing units in the development plans and the actual output is even greater.

To allow a better grasp of performance we have summarised in Table 8.2 the output of the
NHC relative to the various development plans.

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[1] Note:

(a)   The ratio of average cost to median wage is not given explicitly in the respective development plans. It
      has been derived by dividing average costs implicit in the plans by actual median wages.

(b)   The median earnings per year are for the main towns. Their values, for the respective periods, are, Kenyan
      £: 240 (1970-74); 350 (1974-78); 670 (1979-83) and 810 (1984-88)

Table 8.2 NHC Output: Indicators of Relative Performance

	Actual No. of Units as a % of Development Plan Targets	Actual Budget as a % of Development Plan Targets	Ratio of Actual Cost per Unit to Development Plan Target
	%	%	
1970-74	50	100	2.0
1974-78	14	56	4.0
1979-83	28	73	2.6
1984-88	12	74	6.2

The table shows that in the 1970-74 plan period, the actual budget matched the planned budget while the actual cost per unit was twice as high as the target. Consequently, the NHC's output was only a half of that projected in the plan. In the development plan that followed (i.e. 1974-78), the actual budget fell sharply relative to the target in the plan. As the figures in Table 8.1 show, the 1974-78 development plan budget was nearly twice as large as the actual budget. In the circumstance, had the actual average cost not exceeded the planned cost the Corporation would have produced about a half of the units projected in the plan. However, the drastic fall in the budget was also accompanied by a four-fold increase in the actual average cost. Taken together, these two factors had the effect of reducing the actual number of units to about 14 percent of the development plan target; but of the two factors, the average cost had the greater impact. The size of the actual budget is generally outside the control of the NHC. For this reason, the effect of a reduced budget on dwelling production cannot be imputed to inefficiency. On the other hand, the average cost depends on the design standards selected by the NHC and on productive efficiency. It is difficult to disentangle the separate impacts on cost of the design standards selected, and the efficiency of the production process. We can, however, make some tentative judgements. In our assessment of productive efficiency in Chapter 5, we concluded that, on balance, the NHC is as productively efficient as private developers.[2] It is apparent, therefore, that the high average costs were not brought about by productive inefficiency[3] but by the selection of design standards substantially higher than those implicit in the plan.

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[2] The large projects implemented recently in Nairobi are being disregarded here because they are atypical.

[3] Our assessment of productive efficiency was based on recent projects. It is assumed here that the Corporation's efficiency has remained unchanged over time.

In the plan period 1979-83, the actual budget as a percentage of the planned budget was 73 percent while the actual cost per unit exceeded the target by a factor of 2.6. As a result of the lower actual budget and higher average cost, the number of units was only 28 percent of the target. Here again, of the two factors, the average cost had the greater impact. In the plan that followed, 1984-88, the actual budget was 74 percent of the planned budget and the actual cost per dwelling over six times as high as that planned. The number of units produced was therefore only 12 percent of the number planned and, yet again, the average cost had the greater impact in terms of reducing dwelling output. Later, we will investigate why the NHC selected design standards much higher than those implicit in the various development plans.

Referring back to Table 8.1, it will be seen that in all the development plan periods, the actual ratio of average cost to median wage was substantially higher than the target ratio. This is not surprising given the dramatic growth of the actual average cost. In effect, the higher ratio meant that, in relative terms, fewer households could afford dwellings developed by the Corporation.

On the basis of the performance indicators given here, we conclude that the NHC's performance fell short of expectations by a considerable margin. First, primarily as a result of the selection of higher design standards, the actual number of dwellings was very much lower than could have been produced within the actual budget. Second, the ratio of the average cost to the median wage turned out to be much higher than the ratio implicit in the development plans. As a result, the actual programme was significantly less affordable to lower-income households than the planned programme, thereby reducing the access of these households to the underlying subsidies.

8.3 NHC's Performance: In Search of an Explanation

Our purpose in this section is to venture to explain why the NHC failed fully to meet its goals. There are two types of divergence between the housing programmes contained in the various development plans and the programmes implemented by the Corporation. The first has to do with the disparity between the Corporation's output in terms of value, and the targets in the plans. The lower output reflects under-funding in that the amounts voted to the NHC fell short of the targets in the plans.

The second, and more important, divergence is illustrated by the high ratio of actual cost per unit to the development plan targets (see Table 8.2). This reflects the implementation by the NHC of a programme consisting of dwellings of much higher standards than assumed by the development plans. In particular, the Corporation placed a substantially lower emphasis on site and service projects as shown in Table 8.3.

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Table 8.3   Relative Emphasis on Site and Service Projects:
Development Plans and NHC Programme

	Total Expenditure in Development Plan.	Amounts in Kenyan £ '000			
		Planned Expenditure on S & S	S & S as a % of Total Planned Expenditure	Actual NHC Expenditure on S & S	Actual Expenditure on S & S as a % of Total NHC Expenditure*
1970-74	10970	3600	33	468	4
1974-78	24110	22360	93	4193	31
1979-83	31023	24400**	79	12552	55
1984-88	22040	16090***	73	3061	19

Sources: NHC 1986/87 Annual Report; NHC records; Various
Development Plans.
*   Total NHC expenditure is shown in Table 8.1
** Amount includes Kenyan £ 16.9 million under Urban 2.
*** Amount is in respect of Urban 2 and Urban 3 projects.

The table shows that while the development plans assumed that expenditure on site and service projects would range from 33 percent of total expenditure in 1970-74 to 93 percent in 1974-78, the actual expenditure was only 4 percent of the funds voted to the NHC in 1970-74, rising to 31 percent in 1974-78. Only in the next plan period, 1979-83, did relative expenditure on site and service projects rise to 55 percent, falling again to 19 percent in the following plan period.

Site and service projects are usually designed to basic standards in order to make them affordable by households within the second to fifth deciles of the income distribution.[4] The cost per unit should therefore be much lower than the unit cost of other dwelling types that have higher design standards. This means that the Corporation's substantial shift away from a programme based largely on site and service projects automatically led to higher costs per dwelling unit. We have already argued that the higher costs could not, to any significant extent, be attributed to productive inefficiency. It remains to explain, however, why the NHC's actual

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[4]   This, for instance, was the target population in the Dandora project, the first major site and service project in Nairobi (see World Bank, 1983). Households below the second decile are usually considered too poor to afford plots in site and service schemes.

programme was drastically different from that projected in the development plans.

In a number of its annual reports, the Corporation has raised considerable doubt concerning the viability of site and service projects. Indeed in its 1986/87 annual report, it announced a departure from such projects. This attitude is consistent with the strong political antipathy towards these schemes, which is well documented by Werlin (1974). He argues that politicians believe that site and service projects, with their emphasis on basic standards, would inevitably degenerate into slums. In the face of such political opposition, it is perhaps remarkable that between 1974 and 1983, the NHC did implement a programme in which site and service projects featured prominently. The view by Coopers and Lybrand (1981) and the World Bank (1983) that the NHC could have produced more site and service units at lower costs probably disregards the political constraints that the Corporation faced. Stren (1978) is of the opinion that the NHC's output, both in terms of site and service and conventional projects, has been high relative to that of similar corporations in Africa but, even so, he takes note of the disparity between targets and actual output.

The NHC also encountered a number of technical difficulties besides the political problem mentioned here. The 1974-78 development plan (RoK, 1974) pointed out that the implementation of site and service projects is a complex undertaking that often faces considerable problems of policy, organization and financing. Further, it went on, there had been a shortage of skilled personnel to plan and implement such projects. It could be argued that if these problems had not been foreseen, then the development plans were too ambitious.

Finally, the shortfall in performance, especially during the plan periods 1974-1978 and 1979-83, is also partially explained by the fact that a significant proportion of the site and service programme came under the direct responsibility of local authorities. This was the case in respect to projects implemented with financial support from the World Bank. In these projects, the role of the NHC was limited to the disbursement of project funds, with the responsibility for implementation assumed by local authorities. The projects encountered considerable delays, an outcome that is reflected in the NHC's overall output shown in Table 8.1. Our data do not allow the isolation of the impact of these projects on the Corporation's output. In the wider context, the behaviour of the NHC may have been a response to the strategy of donor agencies of allocating substantial resources to site and service projects. As a result, the Corporation may have believed that in order to ensure a "balanced" programme overall, the larger part of its own funds should support conventional projects.

As the NHC's relative expenditure on site and service projects declined, so did expenditure on much higher-income housing rise. Higher-income units in the current programme, defined to

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include rental, and tenant-purchase (Type 2) dwellings,[5] as well as dwellings for sale on mortgage terms, account for nearly 95 percent of the estimated value of all projects (see Table 2.2). The reason for this dramatic re-orientation of the Corporation's programme is not entirely clear. However, it appears to be a response to two factors. The first is that for "mortgage" projects, the NHC is required to provide only short-term funding during construction since long-term loans to buyers are made by other housing finance institutions. This is an important consideration, especially when there are major budgetary constraints. Short-term funding allows the Corporation to revolve its financial capital fairly rapidly, which it cannot do where it is required to provide long-term finance. It is therefore able to help more people, though not the poorest. The other factor is that since many local authorities are in default, there may be little incentive to lend more to such authorities. On the other hand, a programme dominated by "mortgage" projects allows the NHC to meet some of its goals without having to lend to local authorities.

It appears to be the case that the shift away from a programme based mainly on site and service projects was not accompanied by an alternative policy towards low income housing. Indeed, unlike previous development plans, the current plan, 1989-93, does not contain housing investment targets. This means that there are no specific guidelines on which the NHC could base its housing programme. In the absence of such constraints as the development plan would usually bring to bear, and given that the implementation of site and service projects is considered highly demanding (RoK, 1974), the shift towards conventional projects has probably been inevitable.

Another important change that requires explanation is the decline of rental housing, as is evident from Table 2.1. Between 1965 and 1989, the proportion of rental housing in the Corporation's programme fell from 44 percent to just over 10 percent in terms of numbers, and from about 50 percent to 10 percent in terms of value. This decline reflects the emphasis that the government has continued to place on home ownership (RoK, 1979a, 1983), a policy that has been supported by the main donors such as the World Bank and the United States Agency for International Development.

To conclude, the shortfall in NHC's performance relative to development plan targets is explained largely by a combination of under-funding, the shift towards higher standard housing, and the implementation difficulties faced by both the Corporation and local authorities. The shift towards higher standards, arguably the most important of these factors, is in turn explained by political opposition towards site and service projects and probably also by the technical difficulties of implementing such projects. Overall, the NHC has been able to exercise considerable discretion in determining the type of programme to finance.

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[5] Tenant-purchase (Type 2) projects, as classified in Table 2.2 in Chapter 2, are those financed, not out of donor loans, but out of ordinary Treasury loans.

8.4 Breakeven and Subsidy Transfer

In this section we are concerned to investigate whether or not the NHC is able to break even on the basis of historic costs, and to explore the consequences for the Corporation's social goal of transferring to beneficiaries, the subsidies implicit in government loans and land. A breakeven policy means that taking one year with another, the NHC's income should be sufficient to meet all expenses chargeable to income. We saw in Chapter 2 that the Corporation's principal activities are making loans to local authorities and acting as a developer. Our analysis starts with the straightforward, though hypothetical, case where the NHC confines its operations solely to making loans. It then moves on to look at the more realistic situation where the Corporation acts as both a financier and developer.

If the NHC acted purely as a financial intermediary, it would break even so long as its running costs were covered by the administrative margin, currently 0.5 percent, that it levies on the loans it makes. As the Housing Act does not prohibit bigger margins, higher running costs could be met by raising the margin, again allowing breakeven to be attained. Alternatively, the NHC could raise its interest rates to a level substantially higher than the 6.5 percent it currently charges.

Should the NHC break even without having to raise its lending rate substantially, either via bigger margins or higher interest rates, it would, in effect, be transferring to local authorities the quantum of subsidies embodied in government housing loans. Breakeven under such circumstances would point to management effectiveness. On the other hand, if it became necessary to charge significantly higher interest rates and margins in order to break even, it would be sensible to conclude that management was ineffective.

We have restricted our discussion so far to the case where the NHC acts solely as a financial intermediary. We saw in Chapter 2, however, that in recent years the Corporation has tended to act as the developer of all the projects it finances. Hence, the extent to which the Corporation can transfer subsidies depends on both management efficiency and productive efficiency. To illustrate this point, we will use the relationship between the minimum cost of a project C, the subsidy S that can be transferred subject to breakeven, and the project price P charged by the NHC. Thus,

$$C = S + P$$

It is assumed that C is equivalent to the market price and is therefore outside the control of the NHC. This means that only the subsidy S and the Corporation's price P are allowed to vary.

We will consider three situations. The first is where the Corporation's management is efficient and productive efficiency is also attained. The second is where either or both management and productive efficiency are not achieved. The third is where the subsidy is negative.

Where the NHC attains both management and productive efficiency, it is able to transfer to beneficiaries the maximum subsidy possible subject to break even. The total subsidy is made up of both interest rate and land subsidies. It is important to point out that the total subsidy could be transferred to many or to a few people, depending on the cost per dwelling. Where high design standards are selected, thus reducing the number of dwellings that can be built for a given outlay, there would be "deep" subsidies to each beneficiary. On the other hand, if basic design standards were adopted, as a result of which the number of units and hence of beneficiaries would rise, there would be smaller subsidies to each beneficiary. The average subsidy would therefore vary directly with the cost per dwelling.

Where the NHC is not able to attain either or both management efficiency and productive efficiency, it could still break even if it increased its price P and reduced the subsidy S. Here, again, the subsidy to each beneficiary and therefore the total number of beneficiaries would vary directly with the average cost. However, given that minimum costs would not have been achieved, the total subsidy to all beneficiaries would be less than in the first case. At the limit, the total subsidy would tend to zero and in spite of breaking even the NHC would have failed completely to meet the goal of transferring subsidies to beneficiaries.

The third situation is where the subsidy is negative. Since no sensible buyer would be willing to pay more than the market price the NHC would not be able to break even. Instead, the Corporation would make a loss equal to the negative subsidy. In other words, the negative subsidy defines the amount by which the Corporation would need to reduce its price for houses to sell.

The three situations we have described illustrate the relationship between the breakeven goal, the transfer of subsidies and the subsidy per beneficiary. The analysis, by showing that the average subsidy varies directly with the average cost when productive efficiency is assumed constant, also provides a link to our earlier discussion concerning the selection of design standards. To summarise, where the NHC achieves both management and productive efficiency and selects basic design standards, the total subsidy transferred is a maximum, the subsidy per beneficiary is small, and breakeven is achieved. For a given outlay, higher design standards mean a smaller number of beneficiaries and larger subsidies to each beneficiary. The total subsidy declines as management and productive efficiency fall and at the limit, assuming that the breakeven constraint is not violated, tends to zero.

Our next step is to examine the NHC's income and expenditure account for evidence of whether or not breakeven is achieved. The income and expenditure account is made up of five separate accounts covering salaries and general administration, loan interest, property and estates,[6] maintenance of fixed assets and depreciation of fixed assets. Overhead costs are comprised of salaries and general administration (with the exception of salaries of technical staff), maintenance of fixed assets and depreciation of these assets. The NHC allocates overheads in proportion to the direct costs of projects (Price Waterhouse Associates, 1987). This method is used to resolve the difficulty of assigning joint production costs. Salaries of technical staff are treated as direct costs and are assigned to projects via charges for professional fees in respect of design and supervision.

In Table 8.4 we have shown the trend of these accounts over a five-year period. The table shows that overall, the NHC not only breaks even every year on its recurrent account of income and expenditure, but that it also makes a surplus, though modest. The accounts, however, do not permit insight into the extent to which subsidies are transferred to beneficiaries. That substantial subsidies are transferred is not in doubt. First, there is no evidence that the NHC systematically raises prices to cover costs.[7] In other words, referring back to our earlier analysis, it is not obvious that the NHC generally raises its price P and reduces the subsidy S. Second, we demonstrated in Chapters 6 and 7 that NHC financed housing is highly subsidised. Given that the Corporation breaks even and also manages to transfer a significant amount of subsidies to beneficiaries, it would appear that it meets, to some extent, the criterion of effectiveness.

8.5 Management Efficiency

To assess the efficiency of management we shall look at its ability to meet its project budgets in terms of cost and time, to contain operating costs, and to recover loans.

8.5.1 Project Cost and Time Budgets

Between 1984 and 1989, the NHC completed some 28 projects countrywide. We reviewed 26 of these, noting problems relating to project implementation. Perhaps the most serious of these problems was the high incidence of delays in making interim payments to contractors. The importance of prompt interim payments is well acknowledged as such payments reduce the period over which the contractor needs to finance labour, materials and plant from his own resources (Stone, 1983). Where long delays in payment occured, contractors either stopped work altogether or made drastic reductions in site labour and plant.

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[6] This account is comprised of income and expenditure on the headquarters building, as well as on a small number of rental estates directly managed by the Corporation.

[7] One important exception is Kibera Phase 1. In that project, the NHC's selling price was KSh 320,000 but our predicted market value is only about KSh 260,000 (see Chapter 6).

Table 8.4 NHC: Income and Expenditure (Kenyan £ '000)

	1985	1986/87	1988/89
Salaries and General Administration			
Income	382.9	261.1	459.1
Expenditure	1,417.6	2,050.5	2,550.6
Surplus	-1,034.7	-1,789.4	-2,091.5
Interest Account			
Income	4,349.3	5,382.9	6,230.8
Expenditure	3,548.7	4,016.0	4,470.3
Surplus	800.6	1,366.9	1,760.5
Property and Estates			
Income	748.7	1,007.9	967.6
Expenditure	422.4	419.2	454.3
Surplus	326.3	588.7	513.3
Maintenance of Fixed Assets			
Income	20.9	12.2	17.2
Expenditure	49.2	80.0	99.2
Surplus	-28.3	-67.8	-82.0
Depreciation of Fixed Assets			
Income	15.7	1.9	1.0
Expenditure	56.8	92.5	86.4
Surplus	-41.1	-90.6	-85.4
Overall Surplus	22.8	7.8	14.9

Delays in payment meant higher project costs for a number of reasons. First, the construction period often had to be extended and this implied higher financial charges on construction finance. Second, where delays were rather long, contractors submitted claims in respect to idle labour, and charged more for building materials and plant. Third, where they had had to stop construction, contractors demanded that their costs of resuming work be met. These problems are by no means

unique to the NHC. In some of the private projects we examined there was considerable evidence of delayed payments to contractors and even stoppage of work.

Yet another difficulty faced by the NHC had to do with the time it took to dispose of completed dwellings, either by means of selling them or turning them over to local authorities. With dwellings remaining vacant for long periods, additional costs were incurred in the form of interest foregone on the underlying capital expenditure, security charges to ensure that dwellings were not vandalised, and costs of making good defects.

In Table 8.5, we have made comparisons between two types of performance indicators for NHC projects. The first is a comparison between the estimated development cost per square metre at the time of tender and the final development cost. It was not possible in all cases to establish whether or not the final development cost included all the additional charges arising from delays in dwelling sales. As a result, the cost overruns implied by the table are conservative estimates of the actual outcome. Second, we have compared the initial contract period, as stated in the contract documents, with the actual construction period. The indicators employed here show the extent to which a client, in this case the NHC, is able to design and enforce construction contracts. In principle, the tendered cost figure is supposed to commit a building contractor to a specific cost target. Similarly, tender documents will specify the construction period. For a variety of reasons, not all of which can be imputed to inefficiency, the eventual cost tends to be different, and quite often higher than the tender amount. For instance, the client might change design standards during construction; variations to the scope of work might become necessary; the construction contract might not provide adequate safeguards against additional financial claims by the contractor, and client supervision of the contractor might fall short of the required standards. In spite of these contracting difficulties, it may be hypothesized that an efficient management will strive to ensure that the outcome, in terms of cost and time, is not substantially different from the original expectations; hence the use of the indicators given here to assess one aspect of management efficiency. The indicators reveal the degree to which, in relative terms, time and cost budgets have diverged from projections.

The table shows that in practically all cases, the final development cost was higher than the development cost based on the tender amount.[8]

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[8] Where the "greater than" sign has been used the final figure was considered larger but was not available.

Table 8.5   NHC Projects: Performance Indicators Relating to Time and Cost Budgets.

| col.1 | Costs in KSh | | | in weeks | | |
| Project Development cost per square metre based on tender (or negotiated) amount | Final development cost per square metre | Ratio of col.3 to col.2 | Initial contract period | Actual contract period | Ratio of col.6 to col.5 | |
	col.2	col.3	col.4	col.5	col.6	col.7
Tenant Purchase Projects*						
Kibera	5118	7815	1.5	88	>107	>1.2
Pumwani						
Site A}	4089	4869	1.2	35	87	2.5
Site B}				52	80	1.5
Naivasha	2672	3206	1.2	52	>112	>2.2
Muranga	2280	n.a.	n.a.	45	98	2.2
Kitui	2490	2533	1.0	30	30	1.0
Kakamega	2145	3111	1.5	78	>117	>1.5
Siaya	2166	2388	1.1	60	>92	>1.5
Kiambu	2087	3006	1.4	52	88	1.7
Londiani	1897	3483	1.8	40	56	1.4
Isiolo	1894	>2765	>1.5	52	104	2.0
Narok	2850	>3050	>1.1	52	61	1.2
Machakos	2000	>2550	>1.3	40	>92	>2.3
Nyahururu	2175	2095	1.0	52	68	1.3
Rental Projects*						
Wundanyi	3223	n.a.	n.a.	65	77	1.2
Karatina	2945	3115	1.1	40	49	1.2
Kajiado	n.a	n.a.	n.a.	48	64	1.3
Kabarnet	2628	2797	1.1	32	43	1.3
Maralal	3649	n.a.	n.a.	40	160	4.0
"Mortgage" Projects*						
Uhuru Gardens						
Phase 1	3442	3814	1.1	80	84	1.1
Phase 2	4280	4774	1.1	80	105	1.3
Phase 3	4280	4774	1.1	78	88	1.1
Onyonka	2369	4095	1.7	91	221	2.4
Eldoret	3484	n.a.	n.a.	40	80	2.0

Table 8.5 Contd.

col.1	col.2	col.3	col.4	col.5	col.6	col.7
Project Development cost per square metre based on tender (or negotiated) amount	Final development cost per square metre	Ratio of col.3 to col.2	Initial contract period in weeks	Actual contract period in weeks	Ratio of col.6 to col.5	

col.1	col.2	col.3	col.4	col.5	col.6	col.7
Nyeri	3816	>4740	>1.2	50	134	2.7
Kisumu	4196	n.a.	n.a.	65	93	1.4
Kiboko	4146	>4768	>1.2	60	>105	>1.8
Mean	2873	3452		55	92	

n.a.= not available

* Projects have generally been named after the town in which they are located.

In 25 percent of the projects on which data were available, the difference was as high as 50 percent. The table also shows that practically all projects experienced delays. At least 50 percent took half as long again to implement as projected and 30 percent twice as long. The interpretation of these performance indicators is not without difficulty. Where, as a result of unforeseen circumstances, a project experiences delay or incurs extra costs it would be invalid to ascribe such deviations to management inefficiency. This in turn raises another difficulty, that is, how unforeseen circumstances are to be defined. Even so, the pervasive cost and time overruns revealed by our data point to management inefficiency in contract management. Evidence from the United Kingdom, for instance, shows that "... it is possible to increase the speed of many projects, and that there is room for improvement in building activity" (Briscoe, 1988, p.288). It is reported further that the fastest projects take only 30 percent of the average time and the slowest projects twice as long as the average.

8.5.2 Operating Costs

Our concern here is to gain insight into how cost-effective the NHC management has been in administering its lending programme. To do this, as pointed out in in the chapter on research method, we shall first examine how operating costs have changed in real terms, comparing their growth with the growth of the Corporation's lending programme. Operating costs consist of expenditure on salaries, allowances, general administration, maintenance of fixed assets, as well as

depreciation charges.[9] The lending programme, measured in terms of total loans made and outstanding, reflects the ability of the NHC to plan and implement projects, make loans to local authorities, and manage the associated loan portfolio. It is therefore one measure of the NHC's output. As a complementary measure, we will also examine the real growth of salaries and allowances, as well as the annual changes in output. Annual output will in this case be taken to be the sum of the value of projects completed and the increment to work in progress. Our hypothesis is that, in real terms, the NHC's cost-effectiveness in managing its lending programme has declined over time. The second approach will be to compare the NHC's operating costs with those of other financial institutions.

Data on the Corporation's operating costs, salaries and allowances, outstanding loans, and output are given in Table 8.6. In each case, amounts have been shown in both current and constant prices. To obtain constant values we have deflated current amounts by the GDP deflator implicit in the GDP series in the 1989 Statistical Abstract. An index of real growth is also given. The table shows that in real terms, operating costs grew by 68 percent between 1982 and 1988/89, salaries and allowances doubled, and outstanding loans rose by 11 percent. Turning to output, the table shows no systematic trend and the year on year changes have varied widely. Indeed, in a half of the cases output has been below the base year (1982) output. These data provide strong evidence that the Corporation's operating costs, especially salaries and allowances, have grown substantially faster than either the Corporation's lending programme or output. This finding bears out our earlier hypothesis that the NHC's cost-effectiveness in managing its lending programme has declined over time. The result is consistent with the hypothesis by Williamson (1964) concerning expense preference by managers. The supposition here is that in the absence of strict monitoring, managers will overconsume perquisites. If, on the other hand, a competitive labour market existed overconsumption would probably be penalised via *ex post* settling-up as hypothesised by Fama (1980). The discipline imposed on managers by the managerial labour market was discussed in Chapter 3.

In spite of their relative growth operating costs are comparable to those recorded by the Housing Finance Company of Kenya (HFCK) but lower than those of another public enterprise, the National Bank of Kenya (NBK) (see Table 8.7). The HFCK is a publicly owned, deposit taking company established to make mortgage loans primarily to middle-income house buyers. Like the NHC, it also acts as a developer although indirectly through a wholly-owned subsidiary. As the HFCK is controlled by the public sector, it could be argued that its control regime is comparable to that of the NHC.

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[9]   Maintenance and depreciation charges are in respect of plant and equipment, motor vehicles, furniture, and the headquarters building. The running costs of the few rental estates directly managed by the NHC have been excluded.

Table 8.6 NHC: Cost-effectiveness in Administration
            of Lending Programme
            (Amounts in thousands of Kenyan £)

	1982	1983	1984	1985	1986*	1986/ 87**	1987/ 88	1988/ 89
OPERATING COSTS								
In Current Prices	1004	1149	1303	1655	1792	2373	2647	2872
In Constant Prices	1004	1041	1065	1250	1228	1626	1710	1683
Index	100	104	106	125	122	162	170	168
SALARIES AND ALLOWANCES								
In Current Prices	511	683	734	900	1545	1309	1568	1762
In Constant Prices	511	619	600	680	1058	897	1013	1033
Index	100	121	117	133	207	176	198	202
OUTSTANDING LOANS								
In Current Prices	37349	40310	41536	49290	51323	61290	70821	70675
In Constant Prices	37349	36521	33935	37214	35156	41984	45750	41416
Index	100	98	91	100	94	112	122	111
OUTPUT								
In Current Prices	8611	5466	4072	12275	3920	15836	15231	9584
In Constant Prices	8611	4952	3327	9268	2685	10848	9839	5616
Index	100	58	39	108	31	126	114	65

Source: NHC Income and Expenditure account: Various years
* Half a year. Amounts likely to be distorted since assumed to be
  twice the value for half a year.
** Adjustment in year reflects a change in NHC's financial year.

The NBK is a commercial bank, and besides its lending operations, it also accepts savings.
While the nature of its operations is different from that of the NHC it is, like the Corporation,

publicly controlled. Moreover, the NBK seems to operate in a lending environment not dissimilar to that of the NHC. For instance, Grosh (1987) observes that publicly owned banks are required to lend to public enterprises, including those that are insolvent and which would ordinarily not qualify for commercial loans. This is akin to the NHC's practice of lending to local authorities, some of which are in default on previous loans. It seems sensible, therefore, to make comparisons of operating costs between the two institutions.

Table 8.7   Operating Costs as a % of Outstanding Loans
            for Three Public Enterprises

	NHC	HFCK	NBK
1974	1.2	2.2	n.a.
1975	2.0	1.9	n.a
1976	2.0	1.9	4.1
1977	2.1	2.4	3.9
1978	2.4	2.5	3.8
1979	2.6	2.9	15.4
1980	2.5	2.5	5.1
1981	2.7	2.3	4.3
1982	2.7	15.8*	5.4
1983	2.9	7.0*	5.4
1984	3.1	n.a	7.7

Source: HFCK and NBK data from Grosh (1987).
        NHC percentages derived from annual accounts.
* Grosh considers these figures suspect, stating that their
  atypical size is probably explained by a change in
  accounting categories.
n.a. = not available

Differences in the operations of the three organizations probably do not allow a straightforward judgement of whether or not the NHC is better able to contain operating costs than either of the other two. Even so, there are substantial similarities, at least between the NHC and the HFCK, to justify comparison. Both institutions are publicly owned and controlled, as we have already seen, and their main business is making long-term housing loans. Indeed, the NHC's clientele, comprising local authorities and lower-income individuals, probably poses a greater credit risk than the HFCK's higher-income borrowers. This suggests that the NHC could be facing larger operating costs in loan recovery. Unlike the NHC, though, the HFCK faces the problem common among housing finance institutions of "borrowing short" and "lending long".

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Nonetheless, given that it is owned by the public sector, the HFCK is protected from the threat of bankruptcy. To conclude, therefore, it could be argued that the NHC's operating costs are not atypical.

8.5.3 Loan Recovery

The NHC's record in loan recovery has been criticised by the Controller and Auditor-General (Corporations), as exemplified by his comments on the 1985 accounts of the NHC. He noted,

> "The position regarding the non-recovery of the Corporation's loan charges from Local Authorities has continued to deteriorate year after year. In 1985 the arrears of loan charges increased from Kenyan £ 7,285,938 as at 31st December, 1984 to Kenyan £ 8,053,487 as at 31st December, 1985. As for previous years the Corporation explained that it had sought Government assistance in the matter and that a decision was being awaited on the same. It is, however, not clear why it has taken so long for appropriate corrective action to be taken." (NHC, 1988:1)

It should also be pointed out that as the NHC does not charge additional interest on arrears, local authorities are unlikely to have much incentive to repay their loans on time. Further, tenant-purchase and rental dwellings under the direct management of the NHC are also in substantial arrears as a result of difficulties in enforcing tenancy agreements.

Coopers and Lybrand (1981) observe that loan agreements have traditionally not been entered into between the NHC and local authorities, a practice that does not augur well for loan recovery. The general lack of loan agreements has probably meant that the obligations and rights of the lender and borrower are ambiguous. As a result, the NHC may have found it difficult to enforce prompt loan repayments by local authorities. This is especially true of site and service projects, whose loan obligations some local authorities have declined to assume (Personal discussion with NHC officials, 1989). In the event of a local authority defaulting on its loan repayments, the NHC is empowered by the Housing Act to place a lien on local authority assets. The NHC could, for instance, appropriate the rates ordinarily collected by a local authority. This remedy, however, has never been applied probably because of the political difficulties it would raise. Nor has the Corporation imposed lending embargoes on defaulting local authorities.

To demonstrate the extent of the loan recovery problem, we shall consider two ratios, namely:

(a) Ratio of local authority arrears to loans advanced by the NHC.

(b) Ratio of arrears to monthly rent or loan charges, as the case may be, for both the NHC and

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The trend of the first ratio is shown in Table 8.8 and that of the second in Table 8.9. The second ratio complements the first by illustrating the arrears position of the NHC relative to that of the NCC.

Table 8.8 Ratio of Local Authority Arrears to NHC Loan Advances

Year	Cumulative loan advances	Cumulative Arrears	Arrears as a % of Loan Advances
	Amounts in KSh '000		
1972	229,746	6,360	2.8
1973	253,192	10,284	4.1
1974	269,222	9,203	3.4
1975	274,430	12,010	4.3
1976	329,290	10,253	3.1
1977	365,715	9,571	2.6
1978	393,614	10,579	2.7
1979	426,374	11,851	2.8
1980	490,760	17,798	3.6
1981	594,172	37,861	6.4
1982	686,800	49,315	7.2
1983	752,563	89,587	11.9
1984	776,395	145,719	18.8
1985	926,886	161,070	17.4
1986*	967,102	204,547	21.2
1986/87**	1,157,995	260,801	22.5
1987/88	1,332,314	348,150	26.1
1988/89	1,326,796	429,333	32.4

Source: NHC Balance Sheet: various years.
* Half a year to 30th June.
** Adjustment in year reflects a change in NHC's financial year.

The ratio in Table 8.8 rose more than ten-fold over a period of about 15 years, reflecting the dramatic growth of arrears in absolute and relative terms. Recent difficulties in obtaining

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[10] The use of different denominators in deriving the ratio, that is, rents or loan charges, should not introduce a significant bias. In Table 8.9, comparisons are made between ratios relating to rental housing loans, on the one hand, and ratios relating to tenant-purchase housing loans, on the other. Rents in public housing are based on the recovery of loans over a much longer period than is the case for tenant-purchase housing loans (see financing terms in Chapter 2). This seems to suggest that for a given loan amount, rent would be a smaller denominator than loan charges in which case a comparison of ratios based on different divisors would introduce a bias. However, rents also take into account management and maintenance charges, ground rent and rates, making them about equal to loan charges. The use of rent or loan charges as the denominator in the ratio does not therefore introduce a significant bias.

sufficient government loans to meet its requirements for capital expenditure compelled the NHC to send a mission to local authorities urging them to settle outstanding debts. This action was considered by the NHC to have been successful in that the rate of debt recovery over a six month period in 1989 rose to KSh 23 million, up from KSh 3.5 million over an equivalent period a year before. Although it is unlikely that this tempo of loan recovery could be sustained in the longer term it does suggest that the growth of arrears could have been contained by more resolute pressure to pay on local authorities in default. It is therefore difficult to avoid the conclusion that the growth of arrears reflects organizational slack.

8.5.4 NHC and NCC: Comparing Arrears

Another way of evaluating the NHC's ability to recover loans is to compare its performance with that of other institutions engaged in similar activities. We were able to obtain data on rent collection and loan recovery from the Nairobi City Commission, and can therefore draw comparisons with the NHC. The NCC, as we saw in Chapter 7 manages public rental housing largely financed by the NHC. In Table 8.9 below, we have shown the ratio of arrears to monthly rent or loan charges, as the case may be, for the two organizations. In respect to the NHC, the table shows extremely high ratios of arrears to monthly rent or loan charges. This means that relative to the NCC, the NHC's record on loan recovery and rent collection is very poor. The table also gives some interesting insights. First, local authorities, which in absolute terms account for the bulk of arrears, are much more in default than tenants, as indicated by the ratios in the last column. Only tenants in NHC rural rental housing[11] show, in relative terms, a level of loan arrears equivalent to that of local authorities. Second, if we turn to NCC housing, we see that arrears are quite low. As the waiting list for NCC rental dwellings is long, considerable pressure is exerted on the NCC to evict tenants in default. Indeed, many local authorities are quick to enforce eviction procedures once a tenant is in default. Records at the Ministry of Local Government, for instance, showed that local authorities had either surpluses or only small deficits in their housing fund account and this pointed to strict enforcement of tenancy agreements. Thus, rent arrears are kept low. It would appear that local authorities have the financial resources with which to reduce their arrears on NHC loans. This suggests that improvements could be made to the system of incentives and penalties applied by the government to the NHC and in turn by the NHC to local authorities. To give an example, additional borrowing by both the NHC and local authorities could be made conditional upon the reduction of arrears on previous loans. To conclude, our analysis has illustrated the lack of management efficiency in loan recovery.

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[11] NHC rural rental housing consists of 23 small schemes built in rural centres in the early 1970's. The houses are managed by the provincial administration which, according to the NHC, has not been able promptly to collect rents and turn them over to the NHC.

Table 8.9 NHC and NCC: Comparative Ratios of Arrears to Monthly
Rent or Loan Charges in 1989. Amounts in KSh '000

	Total Loan Charges or Rent due per Month	Total Arrears in 1989*	Ratio of Arrears to Monthly Rent or Loan Charges
NHC Loans to			
Local Authorities			
Municipalities**	2,638	138,775	52.6
Municipalities*** (USAID)	180	15,311	85.1
Municipalities**** (World Bank)	5,182	251,946	48.6
Town Councils	240	8,125	33.9
County Councils	291	15,773	54.1
NHC Housing			
Arrears on Tenancies			
Rural Rental Housing	98	4,971	50.7
Urban Rental Housing	882	5,045	5.7
Nairobi City Commission			
Housing: Arrears on			
Tenancies			
Lower Income Rental Housing	3,366	11,981	3.6
Higher Income Rental Housing	3,569	3,063	0.9
Tenant purchase housing	690	5,659	8.2

Source: Derived from NHC and NCC records
* For NHC loans to local authorities and NHC housing, arrears are as at 31st July 1989. All other arrears as at 31st March, 1989.
** Comprises Government loans onlent to municipalities by the NHC.
*** Comprises USAID guaranteed loans to municipalities.
***** Comprises both World Bank and Government loans onlent by the NHC to municipalities.

8.6 Summary

This chapter set out to evaluate the performance of the Corporation in terms of the effectiveness and efficiency of its management. Effectiveness was assessed on the basis of the NHC's success in meeting targets in various development plans. Care was taken to ensure that the assessment made a distinction between aspects within the control of the NHC and those that were external to its operations. The performance indicators employed were the number of dwellings produced, the average cost per dwelling, the ratio of average dwelling cost to the median annual wage and, finally, whether or not the NHC is able to break even having regard to its social goal of subsidy transfer. On the other hand, management efficiency was investigated in reference to the Corporation's ability to meet project budgets in terms of time and cost, to contain operating costs, and to recover loans.

We saw that the actual budgets had been smaller than planned and that the actual average costs had been much higher than those projected in the plans. As a result, the Corporation had failed fully to meet the targets in the development plans. Whilst the size of the budget fell outside the Corporation's control, the selection of design standards did not. Consequently, the adoption of standards much higher than those contained in the development plans reflected ineffectiveness. We also saw that the actual ratio of average cost to median wage turned out to be much higher than the ratio implicit in the development plans. In effect, there had been a major shift away from a programme meant to benefit lower-income groups to one whose affordability was restricted to higher-income households. To this extent, the Corporation had been ineffective.

The NHC had managed to break even on the basis of historic costs. As there was no evidence that prices had systematically been raised to meet costs, we concluded that the Corporation had, to a significant degree, been effective in transferring subsidies to beneficiaries. This outcome was consistent with our findings in Chapters 6 and 7 where we had seen that NHC dwellings are highly subsidised. The recent shift towards the production of more expensive dwellings, however, is likely to have given higher-income groups greater access to subsidies.

Our examination of management efficiency showed that the Corporation's operating costs had grown faster than output, supporting the hypothesis on managerial discretion via expense preference. Relative to two other financial institutions, however, the NHC's operating expenses did not appear atypical. Finally, we showed that there had been a dramatic growth of arrears on loans to local authorities, a trend that pointed to management inefficiency. Indeed, the NHC had performed worse than the NCC in terms of containing arrears.

9. CONCLUSION

This study aimed to evaluate the NHC, a public enterprise responsible for implementing the government's housing policy. The evaluation comprised two complementary approaches, both meant to determine the extent to which the NHC has been able to meet its immediate and wider social objectives. On the one hand, a direct assessment of the Corporation was made, comparing actual performance with goals in various development plans, as well as with other objectives set by the NHC itself. On the other hand, a comparative evaluation was conducted using private developers as the main reference. On a more limited scale, comparisons were also made with other generally similar public enterprises.

The study was considered important for a number of reasons. First, no other work has attempted an examination of the economic behaviour of the NHC within the context of the theories of the firm. Indeed, we are not aware of similar investigations of other publicly owned firms in Kenya. A study by Coopers and Lybrand (1981) focused on administrative procedures meant to improve the Corporation's operations while another by Price Waterhouse Associates (1987) was concerned to modify accounting methods. Second, the study has attempted a systematic interpretation of a substantial amount of qualitative and quantitative information relating primarily to the NHC and, to a lesser degree, to private developers. Third, our evaluation method and findings could be generalised beyond the context of the study, especially in regard to similar corporations elsewhere in Africa.

We studied the NHC within an eclectic analytic framework, an approach made necessary by the considerable diversity in economic theories of the firm. We sought to confront existing theories with empirical data, in order to establish the extent to which they could explicate the behaviour of the NHC. It was not the purpose of the study, therefore, to extend existing theory.

The two main perspectives on the firm are given by the traditional theory found in conventional microeconomics, and by managerial and behavioural models. The strength of the traditional theory, we noted, is that it is predictive. In other words, it predicts how firms might respond to changes in their economic environment. The purpose of the theory, however, is not to investigate the behaviour of a particular firm but to explain the behaviour of profit maximising firms in a market system. This, in our context, was its main limitation, as the primary concern was to study a specific organization operating under an administrative monitoring and control regime. Nonetheless, the theory helped us to define relevant concepts, such as the necessary conditions for productive and allocative efficiency.

The early managerial models modified the traditional theory by substituting other maximands for profit maximization. They also highlighted the separation of ownership from control, the divergence between the utility functions of owners and managers, and managerial discretion. For the most part, though, the maximands employed in these theories, such as sales revenue and the rate of growth of the firm, are not relevant to this study. The early models, we saw, have been superseded by others that highlight the contractual nature of the firm and which assign an important role to information and uncertainty. Here, too, the focus is the private firm.

In contrast to managerial theories, behavioural theories are non-predictive, their strength lying in their insight into the internal workings of the firm. In particular, they draw attention to conflict and bargaining in decision making within the firm, as well as to the "bounded rationality" of managers.

Besides the traditional theory, the principal-agent model appeared particularly relevant to the study. Implicit in the model is the hypothesis that if the government (principal) does not competently monitor and control the NHC (agent) by means of appropriate incentive schemes, the actual goals of the NHC would diverge from the formal goals set for it. Other models that seemed to be of some relevance were those that focused on expense preference by managers, and property rights. Here, too, testable hypotheses existed. First, if managers exercised managerial discretion via expense preference, such behaviour would be reflected by the rates of growth of salaries and perquisites. Second, given the greater attenuation of property rights in public enterprises, such firms would be less productively efficient than private firms.

Assuming a static partial equilibrium framework, we devised a method to assess the behaviour of the NHC within the context of these theoretical models and the broad hypotheses they proferred. A central concern of the study was to establish the extent to which the NHC is able to meet the government's immediate and wider housing objectives. These objectives mainly have to do with the provision of lower-income housing in a socially efficient and equitable manner. We first examined aspects of efficiency and equity before turning to an overall evaluation of performance.

To start with, we examined the productive efficiency of the NHC relative to private developers. This aspect is important, not only in terms of establishing whether or not the NHC utilises resources efficiently, but also in terms of the underlying implications for subsidy transfer. The subsidies transferred to beneficiaries depend on the cost-efficiency of the NHC, given that housing prices and rents are set administratively on the basis of average cost. Our results suggested that the NHC is as cost-effective as private developers. Unlike the typical private developer, the NHC has the complement of technical staff required to monitor and control

construction contracts. Indeed, it did seem that in as far as the larger projects are concerned the NHC could be more efficient than private firms. Yet, it is in respect to the largest Corporation projects that the formal monitoring and control framework appeared to fail. Three projects in Nairobi provided strong evidence of the substantial inefficiency that could be introduced by the absence of an appropriate monitoring and control framework. Even so, these projects were atypical and, on the whole, there was no systematic evidence to support the hypothesis that the NHC is productively less efficient than private developers.

The second area of evaluation concerned allocative efficiency. Our purpose was to establish the extent to which NHC prices and rents deviate from the long-run marginal cost (LRMC) of housing provision in Nairobi. Our analysis started with the assumption that the housing market is in long-run equilibrium and that, therefore, market prices are a good measure of the LRMC. Since the prices and rents charged by the NHC are, almost without exception, substantially below market levels, they are allocatively inefficient unless they can be justified on social grounds. Correspondingly, the gross rate of return on NHC housing is also lower than the gross market rate of return. Housing markets, however, are almost invariably in disequilibrium, and market prices and rents do not provide a good benchmark for determining allocative efficiency. An alternative approach, we argued, would be to compare the Corporation's rate of return on its housing with a Treasury determined benchmark. NHC dwellings showed a return substantially below such a benchmark, and we concluded that unless the implied subsidies could be justified socially, this result was consistent with the hypothesis that NHC prices and rents are allocatively inefficient.

Our investigation of allocative efficiency also gave insights into the price and interest rate subsidies that underlie NHC dwelling sales. First, there are buyers who benefit from both types of subsidy. A second group of buyers gets interest rate subsidies but no price subsidies. A third group, comprising those who buy NHC houses by means of mortgage loans made by other housing finance institutions, receives no interest rate subsidies and does not necessarily obtain price subsidies.

Since prices are set project by project it appeared that the presence of a price subsidy depends on whether or not, for a given project, the NHC is cost-efficient, as well as on the value of land. Where the NHC is cost-efficient, a price subsidy would be available primarily via below market interest rates, if these apply, and also via the land value, as this is not included in dwelling prices. Moreover, the Corporation does not charge a risk premium. On the other hand, where the Corporation is inefficient its transfer price for dwellings is likely to be higher than the cost-efficient price. A buyer would therefore be engaged in a trade-off between the underlying subsidies and the NHC's productive inefficiency. He would be willing to borrow as long as the

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net subsidy is greater than zero.

To examine equity, our third area of investigation, we turned to the rental housing of the Nairobi City Commission. Our concern was to assess whether or not subsidies are distributed equitably and to do this, we looked at both vertical and horizontal equity. Our analysis revealed that while the distribution of subsidies among NCC tenants was progressive in the lower-income range, distribution was inequitable at higher income levels. Our hypothesis that subsidies to NCC tenants were regressive was therefore not wholly borne out by our results. Moreover, lower-income NCC tenants received larger subsidies than owner-occupiers with comparable incomes, a position that reversed itself at higher income levels. This pointed to horizontal inequity and accorded well with the hypothesis that subsidies are not tenure-neutral. Further, access to subsidies was seen to be substantially impaired given that private tenants, who comprise about 60 percent of all households, pay market rents.

Finally, we conducted a performance evaluation of the NHC in terms of the effectiveness and efficiency of its management. We established that the Corporation had failed, by a substantial margin, to meet goals set out in various development plans. This shortfall in performance was explained, not so much by productive inefficiency, but by a combination of under-funding, a shift towards higher-standard housing and the implementation difficulties faced by both the Corporation and local authorities. Some of the underlying factors, such as under-funding and political opposition towards site and service projects, lay outside the direct control of the NHC. Others were not, such as decisions regarding design standards. In particular, there had been a marked increase in the proportion of dwellings designed to standards much higher than those implied by the development plans. For this reason, average dwelling costs were much higher than planned.

We also saw that the NHC is able to break even on the basis of historic costs, and although there was no evidence that prices had been systematically raised to assure such an outcome, it was likely that not all subsidies implicit in government loans and land had been transferred to beneficiaries. For instance, our analysis showed that salaries and allowances, and indeed operating costs, had grown faster than output, implying the presence of organizational slack. The Corporation's performance in this respect, however, was no worse than that of other generally similar public enterprises. Finally, the dramatic growth of arrears on loans made to local authorities pointed to management inefficiency.

Turning to an overall evaluation of our results, the factors that influence our findings most are first, the quality of the data that we collected and, second, our methodology. In respect to productive efficiency, the cost data available were sufficient to allow comparisons to be made between the NHC and private developers. It is unlikely that the exclusion of land costs, which

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account for only a relatively small part of total costs, could have introduced a substantial bias into our analysis. The method employed to compare costs consisted of two elements. First, we devised a scheme that allowed us to restrict comparisons to projects, private and public, that were broadly similar. Second, we used a hedonic costs approach as a means of cross-checking the validity of our findings. The two methods yielded consistent results suggesting that our inferrence concerning the efficiency of the NHC relative to private developers is justified.

In as far as our investigation of allocative efficiency is concerned, the worth of our findings depends primarily on the reliability of the multiple regression equations fitted for sold dwellings, on the one hand, and for rented dwellings, on the other. We did establish that the estimated equations provide suitable models for predicting market rents and prices. This implies that there is merit in the inferrences we made on allocative efficiency. Further, the multiple regression model employed to investigate equity appeared quite robust. Therefore, our basic approach appears reasonable although some bias might have been introduced by the various assumptions we made on the distribution of income among NCC tenants. It is improbable, however, that this bias was so large as to significantly impair the quality of our results.

Our performance evaluation of the NHC yielded some findings that lent themselves to a straightforward interpretation, and others that did not. For instance, there seemed to be adequate evidence to support the view that under-funding and the selection of relatively high design standards account for much of the divergence between the Corporation's performance and targets in various development plans. However, the causes underlying the shift of the Corporation's housing programme towards higher-standard dwellings for sale via mortgage loans were more difficult to identify and the views we advanced were therefore speculative.

In the introductory chapter we said that the aim of this study is to establish the extent to which the NHC meets both the immediate objectives set for it and the more general objectives of economic efficiency and equity. In other words, we were going to assess whether or not the Corporation is a viable organization, given the objectives set for it by the government. We have employed an eclectic approach to investigate different elements of the NHC's behaviour and, taken together, our findings suggest that the Corporation meets its main objectives. There are, however, a number of important caveats to this overall conclusion. First, as we have seen, the failure of the monitoring and control framework for large projects has led to substantial productive inefficiency. Second, the shift of the Corporation's programme away from lower-income housing points to inequity.

A number of our findings have implications for policy. To start with, the cost-inefficiency of large projects implies that given the political environment in which the Corporation operates,

project size might be directly correlated with the likelihood of failure of the monitoring and control framework. Indeed, taking account of the apparent lack of scale economies, it may be the case that the NHC would be more cost-effective if it restricted itself to small and medium sized projects. Small contractors would probably also benefit from such a policy.

Second, the dramatic shift towards dwellings designed to higher standards is incompatible with the social goal of providing housing to lower-income groups. Nonetheless, the Corporation's behaviour appears consistent when other considerations are taken into account. One is that the NHC is required to provide only short-term funding during the construction phase of "mortgage" projects since long-term loans to buyers are made by other housing finance institutions such as the HFCK. This is an important factor, especially when the budget constraint imposed by the Treasury is severe. Short-term funding allows the Corporation to revolve its financial capital quite quickly, which it could not do were it to provide long-term financing. As a result it is able to help more people, though not the poorest.

Another consideration has to do with local authority loan arrears. Since many local authorities are in default, it could be argued that there is little incentive to make additional loans to such authorities. A programme in which dwellings for sale via mortgage loans are a major component allows the NHC to meet some of its objectives without having to make loans to local authorities. A related attribute that has policy implications, but which the Corporation probably does not take into account in its decision making, is that dwellings for sale on mortgage terms do not benefit from ownership finance subsidies since mortgage loans are made to buyers on market terms. This is a desirable feature from the standpoint of equity as such dwellings are generally sold to households substantially above the median income. To conclude, it would appear to be the case that budgetary constraints and the failure of local authorities to reduce their loan arrears have helped impel the NHC towards "mortgage" projects. This shift may have been further reinforced by the lack of political support for site and service projects, the perceived infeasibility of such projects, and the absence in recent years of an emphatic government policy towards housing for the lowest-income groups.

A second finding that has policy implications concerns the allocative efficiency of NHC prices and rents. We have seen that returns on NHC dwellings are substantially below the benchmark set by the Treasury. Given the overall shift of NHC's programme towards dwellings that are not affordable by lower-income groups, there would appear to be little social justification for charging prices and rents below market levels.

Third, we established that subsidies are not tenure-neutral. In particular, lower-income tenants in NCC rental housing receive higher subsidies than owner-occupiers with comparable incomes. It

would seem, therefore, that such tenants may not have much incentive to be owner-occupiers. This outcome is inconsistent with the government's policy of promoting home ownership and maximising the numbers helped. Equally important is the fact that access to housing subsidies is poor. At the one extreme, many of the poorest households pay market rents in the private informal sector, while at the other extreme, higher income tenants in local authority housing receive substantial rent subsidies. Owner-occupiers, too, benefit from subsidies equivalent to the unlevied tax on the imputed rent of their dwellings.

Finally, there are a number of related areas which could benefit from further research. The first concerns an investigation of the efficiency with which the NHC utilises land relative to private developers. This is an interesting question because the NHC does not pay for its land, while private developers do. Moreover, urban land is a scarce commodity whose opportunity cost is high. The confidentiality with which land transactions are treated did not allow us to investigate land values beyond the immediate requirements of our study. A second area concerns the extent to which construction contracts accord with theoretical models on the design and monitoring of contracts. This problem is interesting because construction is almost invariably faced with considerable uncertainty, not least because of the difficulty of establishing accurately, *ex ante*, the extent of the work to be carried out. The consequence of this is that construction contracts are difficult to design and monitor. This seems to suggest that an organization such as the NHC which has a continuing works programme would, contrary to practice, favour the use of direct labour over outside contractors. A third area would be to assess the housing policy implications of the NHC's recent shift towards developing higher-standard dwellings for sale via mortgage loans made to buyers by other financiers. This approach should allow the Corporation to develop more dwellings but at the cost of not directly helping the poorest households.

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APPENDIX 1

DATA COLLECTION

1. Introduction

This appendix provides further details on data collected during fieldwork in Nairobi between June 1989 and January 1990, and between January and March 1991. As pointed out in Chapter 4, the data required for purposes of evaluation fell into two broad categories, that is, general qualitative information, and statistical data. We shall first discuss the type of general information collected before turning to statistical data.

2. General Information

2.1 Information Required

General information was required on a wide range of issues. First, it was important to identify the government's policies on efficiency and equity. Second, it was necessary to establish what the Corporation's immediate and wider objectives are for it was largely against these that evaluation was to be conducted. Third, there was need to identify the means the government employs to monitor and control public enterprises in general, and the NHC in particular.

2.2 Information Sources

Sources of general information were publications on government policy, and interviews of senior officials of the NHC. The first important source was the national development plan, published by the government every five years since 1966. Development plans contain substantial information, not only on broad economic and social objectives, but also on specific sectoral policies and programmes. Each of the plans sets out the government's housing policies and investment programmes, as well as the specific responsibilities entrusted to the NHC.[1] The second source comprised the Housing Act[2] and the State Corporations Act.[3] These Acts provided considerable insight into the government's monitoring and control framework for the NHC.

The third source consisted of circulars issued by the Treasury, principally on budget preparation, criteria for project selection, and performance indicators. This information gave further insight into the government's framework for the monitoring and control of public enterprises.

The fourth source of information comprised reports of commissions appointed to investigate the performance of parastatals, especially in regard to returns on investments (see RoK, 1979 and

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[1] Not much detail, however, is given in the latest plan, 1989-93.
[2] Laws of Kenya, Chapter 117, 1972 (1953).
[3] Laws of Kenya, Chapter 446, 1987.

RoK, 1982). The fifth important source was Sessional Paper No. 1 of 1986 (see RoK, 1986a). This paper sets out in some detail the government's views on efficiency and equity, and also makes specific references to the housing sector.

Besides published data, other information was obtained by means of interviews of senior officials of the NHC. Two complementary interview methods were adopted. The first consisted of structured discussions based on an interview schedule of open-ended questions. As many of the officials were well-known to the researcher, it was possible to elicit from them detailed responses to questions about the Corporation's policies and objectives. The second approach took the form of unstructured, informal discussions with some of the senior officials. These discussions were useful in that they gave additional insight into actual policies and objectives of the Corporation.

2.3 Evaluation of General Information

The information obtained provided an adequate basis for identifying and evaluating the NHC's immediate and wider objectives. It also allowed an evaluation to be made of the government's framework for monitoring and controlling the Corporation. It would have been helpful, however, to obtain a detailed interpretation by the NHC, of the objectives set for it by the government. Although the Corporation's annual reports, for instance, do mention the NHC's attitudes towards housing policy, no extensive interpretation of policy objectives was available.

3. Statistical Data

3.1 Data Required

The information required fell into two main groups, cross-section data and time series data. The specific types of data for each area of study were given in Table 4.2. Our purpose here will be to describe the data collected and, later, to evaluate their sufficiency and quality. The discussion of data collection has been organised around the main sources, which were: the National Housing Corporation, the Central Bureau of Statistics, estate agents, and the Housing Finance Company of Kenya.

3.2 NHC

Statistical data on the Corporation's operations are found in three main sources. The first are annual reports. These mainly provide information on past and current projects, showing tenure type (i.e. rental, tenant-purchase, site and service and "mortgage") and average dwelling costs. The collation of this information was relatively straightforward. Moreover, the data readily lend themselves to comparisons with investment targets in the various national development plans.

The second source consisted of NHC files. The Corporation maintains one set of files on technical and financial aspects of project identification, design, and implementation, and another on the allocation and sale of dwellings. In order to gain access to these files it was necessary to obtain a supporting letter from the NHC's parent department, the Ministry of Lands and Housing.

Cost information on projects is recorded on two forms, one entitled, "Cost Analysis as Tendered" and the other, "Cost Analysis as Executed". The first form gives a breakdown of costs based on the lowest tender, and the second, the costs of completed projects. Although the NHC is also supposed to prepare a "Cost Analysis as Estimated" at the pre-contract stage, it seldom does so.

The main cost categories are building costs; costs of infrastructure services; professional fees in respect of project design and supervision; and interest on construction finance. Dwelling areas and the cost per square metre of floor are also given. We extracted cost data on 26 of 28 projects completed between 1985 and 1989. The selection of 1985 as the starting year was influenced by both the time available for this part of our work and the need to obtain information on a reasonably large number of projects. The filing of the cost analysis forms is not systematic and this made the collation of data a time consuming exercise.

Files on allocation and sale of dwellings contain information on how rents and prices are determined, as well as on the timing of dwelling sales and handing over of completed projects to local authorities. No systematic information, however, was available on the incomes of allottees. The third main source of information consisted of documents prepared on an occasional basis by NHC staff. These usually were internal memoranda evaluating project progress, as well as more detailed progress reports.

3.3 Central Bureau of Statistics

The data obtained from the CBS fell into two categories. The first category comprised returns from private developers and the second, an urban housing survey conducted by the CBS in 1983.

The first category provided project cost data comparable to that of NHC projects. Here, again, our interest was in projects completed between 1985 and 1989, having regard to the need for comparability with NHC data and the time that could be devoted to this aspect of our work. Returns by private developers contained information on development costs of dwellings (excluding land); year of construction; dwelling area; location in Nairobi, and dwelling type. As we pointed out in Chapter 4, private developers are required in law to submit the type of data listed here to the CBS. Our data set, therefore, comprised practically all the approved private projects completed between 1985 and 1989. In all, full information was acquired on approximately 500 projects.

Since names of developers could not be divulged, for reasons of confidentiality, we were not granted direct access to the original data. Names of developers were, in any case, not relevant to the study. The data relevant to the study were transferred by two CBS statistical assistants from the original form to another prepared by the researcher for this purpose. A number of meetings were held with these statistical assistants in order to assure accuracy in the recording of data.

The second source of CBS data was an urban housing survey conducted in 1983 covering Nairobi, among other towns. In Nairobi, data collection was based on a stratified sample of 1,300 residential buildings and about 1,100 households. A description of the CBS' sampling method is

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contained in RoK (1986b). Essentially, the CBS' sampling frame[4] was established by means of physical counts of residential structures. An attempt to use census tracts was not successful as these were not clearly demarcated.

There was considerable advantage in using the CBS data set, although it was a few years old, for we could not have marshalled the resources required to collect an equivalent volume of data. Our task was to extract from survey printouts, data on rents and attributes of private dwellings. These data were used to fit the multiple regression equation given in Chapter 7. Further, the survey printouts also gave household income data on a small sample of NCC tenants. This type of information allowed us to work out the distribution of subsidies by income group for NCC tenants.

3.4 Estate Agents

Our research method required that predictions of market prices and rents for NHC housing be based on attribute or hedonic prices of private dwellings. In order to establish what the attribute prices were, it was necessary to collect information on dwellings sold or let in the market. To ensure that our information was as current as possible, we selected 1989 as the year of reference.

Many property transactions are carried out via estate agents and it was from these firms, therefore, that information was collected. We first compiled a list of the well-established estate agents in Nairobi, with the advice of a practising valuer. It was difficult to establish the exact number of all estate agency firms as some of them are not professionally registered. Nonetheless, the 25 firms in our final list are considered to represent a major proportion of such firms in Nairobi.

Information was collected by means of the questionnaire in Appendix 2. A short questionnaire was preferred for a number of reasons. First, a substantial proportion of dwelling prices and rents is explained by a relatively small number of dwelling attributes. For purposes of prediction, therefore, it is not necessary to collect information on a vast range of attributes. Second, a short questionnaire would not require too much time to complete and respondents should as a result not be particularly averse to providing information. Third, respondents might, in any case, not have in easily retrievable form data on property transactions.

In order to fit a reliable multiple regression equation, it is necessary to have as many degrees of freedom as possible, where these are given by the difference between the sample size and the number of explanatory variables in the equation. Taking this requirement into account and the time available for this part of our work we decided to aim for information on about 100 dwellings sold in 1989 and on an equal number of dwellings let during the same year. In order to allow for a sufficient margin of non-responses and incorrect or missing information, we asked each of the 25 firms to give information on 15 dwellings in each category. To ensure diversity in the dwellings reported on, firms were asked not to select more than two similar dwellings from

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[4]   A sampling frame enumerates members of the population, showing their location or addresses so that all units can be clearly identified in the field (see Bulmer and Warwick, 1983).

each residential neighbourhood. We employed a land economics student from the University of Nairobi with instructions to visit each firm and ensure that questionnaires were completed. In addition, the Ministry of Lands and Housing addressed a letter to all firms requesting them to provide information. Twenty firms completed their questionnaires giving us consistent information on 102 dwellings sold in 1989 and 105 dwellings let during that year.

3.5 Housing Finance Company of Kenya.

The HFCK provided detailed cost data on four projects completed recently in Nairobi by private developers. These projects ranged in size from about 75 to 120 dwellings and were therefore comparable to NHC projects. Information on project-specific land values was also given, and this was helpful in establishing the advantage, relative to private developers, that the NHC derives from its access to "free" government land.

3.6 Evaluation of Statistical Data

The statistical data collected were sufficient, both in terms of quality and quantity, to allow an evaluation of the NHC to be conducted. First, we were able to assess the productive efficiency of the NHC relative to private developers. Second, the data collected allowed us to fit the multiple regression equations used to predict market prices and rents. Such predictions formed an important element in the investigation of allocative efficiency and equity. Third, the data constituted an adequate basis for carrying out a performance evaluation of the NHC.

There were some shortcomings, though, in the data collected. To start with, it would have been useful to obtain data on resales of NHC dwellings. Such information would have allowed us to cross-check how accurately the fitted regression equations predicted prices. Another shortcoming was that the price, rent and dwelling attribute data from estate agents were not based on a random sample of all dwellings sold and rented in Nairobi in 1989. First, not all transactions are handled by estate agents. Second, the well-established firms are likely to deal only in expensive properties. Even so, a number of factors are considered to have reduced the extent of bias. The first is the pooling of data from large and small firms, thereby allowing the "capture" of a range of property types. The second is that many of the firms gave information on all the transactions they had been responsible for and there was, as a result, little intra-firm sampling bias. A third difficulty was the lack of detailed information on the distribution of income among NCC tenants. As a result, the analysis of the distribution of subsidies by income group was tentative. On the whole, notwithstanding the difficulties mentioned here, the data collected were sufficient to allow a reasonably robust evaluation of the NHC to be made.

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APPENDIX 2

Questionnaire to Estate Agents
Dwellings sold in 1989

Notes:

a) Please complete a separate form for each dwelling sold in Nairobi in 1989.

b) Do not select more than two identical dwellings from each neighbourhood.

1. Land reference number..

2. Selling price in KSh. ....

3. Name of location in Nairobi (e.g. Westlands, Eastlands).............

4. Distance of dwelling from the city centre in Km.....................

5. Age of dwelling in years at time of sale...........................

6. Period of unexpired lease in years at time of sale..................

7. Dwelling type (tick as appropriate): Bungalow/ semi-detached house/terraced house/ semi-detached maisonette/ terraced maisonette/ other (specify)...............................

8. Number of bedrooms...

9. The dwelling has a: living room-cum-dining room area/ separate dining area and lounge (tick as appropriate).

10. Number of toilets..

11. Number of bathrooms or shower cubicles...........................

12. Floor area in square metres......................................

13. Plot size in hectares..

14. Main floor finish (tick as appropriate): cement screed/ PVC tiles/ wooden tiles or boards/ terrazo/ granolithic/ other (specify)......

15. Ceiling: Yes/No

16. Servants Quarters: Yes/No

17. Individual car park or garage: Yes/No

18. Other main features (describe)....................................

Note: A similar questionnaire was used for rental dwellings, modified as follows:

Question 2 was replaced with a question on the rent per month.

Question 6 was omitted.

APPENDIX 3

Frequency Distribution of the Cost per
Square Metre for 127 Private Projects
Completed in 1988 and 1989 (KSh)

```
=====CLASS LIMITS====    FREQUENCY  ...........................
   1935.00 <    2055.00       2  |======
   2055.00 <    2175.00       1  |===
   2175.00 <    2295.00       3  |=========
   2295.00 <    2415.00       6  |==================
   2415.00 <    2535.00       2  |======
   2535.00 <    2655.00       5  |================
   2655.00 <    2775.00       3  |=========
   2775.00 <    2895.00       8  |========================
   2895.00 <    3015.00       9  |===========================
   3015.00 <    3135.00       5  |================
   3135.00 <    3255.00       1  |===
   3255.00 <    3375.00       4  |============
   3375.00 <    3495.00       4  |============
   3495.00 <    3615.00       6  |==================
   3615.00 <    3735.00       8  |========================
   3735.00 <    3855.00       9  |===========================
   3855.00 <    3975.00       7  |=====================
   3975.00 <    4095.00       4  |============
   4095.00 <    4215.00       8  |========================
   4215.00 <    4335.00       5  |================
   4335.00 <    4455.00       8  |========================
   4455.00 <    4575.00       5  |================
   4575.00 <    4695.00       0  |
   4695.00 <    4815.00       2  |======
   4815.00 <    4935.00       0  |
   4935.00 <    5055.00       3  |=========
   5055.00 <    5175.00       1  |===
   5175.00 <    5295.00       0  |
   5295.00 <    5415.00       1  |===
   5415.00 <    5535.00       1  |===
   5535.00 <    5655.00       1  |===
   5655.00 <    5775.00       0  |
   5775.00 <    5895.00       0  |
   5895.00 <    6015.00       2  |======
   6015.00 <    6135.00       0  |
   6135.00 <    6255.00       0  |
   6255.00 <    6375.00       0  |
   6375.00 <    6495.00       0  |
   6495.00 <    6615.00       3  |=========
   6615.00 <    6735.00       0  |
   6735.00 <    6855.00       0  |
   6855.00 <    6975.00       0  |
   6975.00 <    7095.00       0  |
   7095.00 <    7215.00       0  |
   7215.00 <    7335.00       0  |
   7335.00 <    7455.00       0  |
   7455.00 <    7575.00       0  |
   7575.00 <    7695.00       1  |===
```

APPENDIX 4

Correlation Matrix: Variables for Sold Dwellings

	LOGPRICE	ROOM4	ROOM5	ROOM6+	WC2	SQ	MEDINC	HIGHINC1
LOGPRICE	1.00000							
ROOM4	-.24467	1.00000						
ROOM5	.33859	-.68162	1.00000					
ROOM6+	.21654	-.35099	-.19862	1.00000				
WC2	.55292	-.09746	.30509	.13123	1.00000			
SQ	.66197	-.07603	.25093	.03167	.41437	1.00000		
MEDINC	-.38495	.45926	-.26579	-.27961	-.05223	-.16130	1.00000	
HIGHINC1	.18451	-.09791	.18582	-.12016	.17698	.23060	-.41238	1.00000
HIGHINC2	.79432	-.33297	.27306	.28983	.26557	.38757	-.54168	-.18544
DIST010	.27787	.14937	.00680	-.08135	.18405	-.23355	.19882	.20350
LSHOLD	-.08158	.10322	-.06465	-.16246	-.11393	-.00398	.17849	-.11500

	HIGHINC2	DIST010	LSHOLD
HIGHINC2	1.00000		
DIST010	-.04285	1.00000	
LSHOLD	-.04089	-.07289	1.00000

CRITICAL VALUE (1-TAIL, .05) = + Or -   .16808
CRITICAL VALUE (2-tail, .05) =   +/-   .19949

N = 97

APPENDIX 5

Correlation Matrix: Variables for Rented Dwellings, 1990

	logrent	ROOM4	ROOM5	ROOM6+	WC2	SQ	MEDINC	HIGHINC1
logrent	1.00000							
ROOM4	-.33249	1.00000						
ROOM5	.43858	-.70154	1.00000					
ROOM6+	.38556	-.23510	-.15542	1.00000				
WC2	.45966	-.00443	.26709	.13785	1.00000			
SQ	.64192	-.09061	.29108	.14484	.50673	1.00000		
MEDINC	-.61564	.30597	-.28944	-.23981	-.08206	-.20957	1.00000	
HIGHINC1	.35820	.05181	.05322	-.13089	.08725	.26258	-.60267	1.00000
HIGHINC2	.70710	-.46343	.37619	.50730	.21194	.28551	-.41973	-.25802
DIST610	-.12422	-.01020	.12095	-.04791	-.06114	-.05937	.12839	-.21216
DIST11+	.19431	-.20739	.19435	.16139	.06353	.08043	-.27159	.01852

	HIGHINC2	DIST610	DIST11+
HIGHINC2	1.00000		
DIST610	.07494	1.00000	
DIST11+	.18420	-.42179	1.00000

CRITICAL VALUE (1-TAIL, .05) = + Or - .16468
CRITICAL VALUE (2-tail, .05) =   +/- .19548

N = 101

APPENDIX 6

Correlation Matrix: Variables for Rented Dwellings, 1983

	LOGRENT	RM2	RM3	RM4	RM5	TOILET	PRIVBATH	COMBATH
LOGRENT	1.00							
RM2	-.33	1.00						
RM3	.12	-.21	1.00					
RM4	.50	-.24	-.46	1.00				
RM5	.33	-.09	-.18	-.21	1.00			
TOILET	.75	-.26	.17	.42	.17	1.00		
PRIVBATH	.75	-.24	.10	.44	.18	.95	1.00	
COMBATH	.05	-.07	-.13	.06	-.06	-.12	-.10	1.00
HOTWAT	.65	-.27	.17	.14	.35	.48	.50	-.16
ELECTRIC	.37	-.20	.16	.18	.07	.43	.41	.05
SQ	.64	-.16	.12	.06	.22	.28	.30	.16

	HOTWAT	ELECTRIC	SQ
HOTWAT	1.00		
ELECTRIC	.20	1.00	
SQ	.49	.12	1.00

CRITICAL VALUE (1-TAIL, .05) = + Or - .23
CRITICAL VALUE (2-TAIL, .05) =   +/- .27

N = 52