# Systems theory and the commercial development process: Towards an understanding of complex behaviour and change

**Edward Trevillion**

**Department of Building Engineering and Surveying**
**Heriot-Watt University**
**Edinburgh**

**Submitted in Partial Fulfilment for the Degree of Doctor of Philosophy**

**September 2001**

# Table of Contents

# List of Tables

# List of Figures

## ACKNOWLEDGEMENTS

There are a number of people I would like to thank for their help and inspiration during the course of this work. Firstly my wife Louyse who has provided encouragement, advice and some sanity through two births and a thesis. I also want to acknowledge the help given by Colin Elliot in the early stages of the work and to Phil Banfill for his steady hand as overall supervisor for the work from beginning to end. Phil in particular had the courage to support the research in the first place and persuaded the University to support it as well. Thanks.

In terms of the discussion and development of ideas, special thanks are due to Derek Kerr and Peter Aspinal. Derek in the early days opened my eyes to the pitfalls of structure and agency. Peter provided sensible advice and guidance during the write up. Thanks to you both.

I must also acknowledge the assistance given by various Departments in the City of Edinburgh Council (particularly the City's Economic Development Team), the EDI Group, and EICC Ltd. Also Mark Robertson at Ryden International Property Consultants for his help in the early part of the work and Andy Carswell at GVA Grimley for a degree of stability as well as useful data in the later stages of the work.

The work was assisted by a research grant from The Carnegie Trust and by financial support from Heriot-Watt University, both gratefully acknowledged.

Edward Trevillion

September 2001

'I seem to have been only like a boy playing on the sea-shore and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst a great ocean of truth lay all undiscovered before me'

Isaac Newton

## ABSTRACT


# Systems theory and the commercial development process:

# Towards an understanding of complex behaviour and change

The thesis examines the hypothesis that the property market, of which the development process forms part, can be conceptualised as a complex adaptive system and places this conceptualisation in the context of existing institutional and other models of the market. It pre-supposes that development and developers, as process and agent, are not autonomous entities and that they find their raison d'etre from within a wider economic and political cultural context. The work therefore focuses on the systems dynamic in and through which development occurs and developers function. Specifically, it looks at *processes* operating in the market place. It has drawn on ideas from evolutionary economics and self-organising systems and applied them for the first time to the commercial property market in order to understand the way in which the market behaves and change occurs.

The analysis of complexity and change highlights the importance of local studies in understanding property market behaviour. In this context, a major study of behaviour in the Edinburgh office market from the mid 1980s to the present has been undertaken. In keeping with system philosophies, an important element of the work has been to generate a broader understanding of market dynamics and a better comprehension of the changing character of property markets. It has attempted to go beyond a simple economic analysis of the circumstances within which the market operates.

CHAPTER 1

# Introduction

"If you place a frog in a pot of boiling water it will immediately try to scramble out, but if you place the frog in room temperature water, and don't scare him, he'll stay put. Now if the pot sits on a heat source, and if you gradually turn up the temperature, something very interesting happens. As the temperature rises from seventy degrees to eighty degrees F the frog will do nothing. In fact he will show every sign of enjoying himself. As the temperature gradually increases the frog will become groggier and groggier until he is unable to climb out of the pot. Though there is nothing restraining the frog he will sit there and boil. Why? Because the frog's internal apparatus for sensing threats to survival is geared to sudden changes in his environment, not to slow, gradual changes." (Senge, 1992).

## DEVELOPMENT AND THE PROPERTY MARKET

### The Hierarchy of Development and Change

Development concerns the introduction and growth of new activities and the successive mutual adaptation of the landscape and the population to these changes, leading to their maintenance and continued development (Allen, 1997, p3). It is about structural change on many levels and includes the way in which urban and regional structures evolve and change as a result of the multiple decisions of the inhabitants. It encompasses the patterns of intra/inter-regional and world trade and commerce (see Allen, 1997).

The commercial property development process and the property market of which it forms part are integral parts of this hierarchy of development and form the focus of the thesis. The work examines the way in which these processes might be described and analysed. Perhaps more importantly, given that development is about change on many levels, the work also examines ways in which this change might be analysed. Specifically, the work uses a systems approach to examine process and change in the market.

An important element of the systems approach is the recognition that systems are dynamic and can adapt and change in response to their environment. Maladaption to gradual changes in the environment, and with it threats to survival, has been so pervasive in systems studies of a variety of organisations that it has given rise to the parable of the boiling frog above. It is a paradigm of systems thinking that in order to understand how a system will react to threats or changes in its environment (often small and incremental in nature), it is necessary to look at the underlying structures which shape individual actions and create the conditions where types of events become likely (Senge, 1992). With this in mind, the work considers a model structure of the property market based on systems theory. This addresses the market in which ownership and occupation are separate. The property market in this context is understood as the production and exchange of commercial property whether through the provision of new property or exchange of existing property in the market place. The work is mainly concerned with the former, also known as the *commercial development process*, but factors are common to both and each impinge on the other. In this context, the work also examines briefly links between the two systems.

## Modelling the Development Process

Adams (1994) notes that if urban planning is to intervene effectively in the development process, it is essential to understand what happens 'behind the scenes'. An attempt must be made 'to conceptualise the development process in order to assess the contribution of particular actors, the significance of specific events and the complexity of relationships that make development happen' (Adams, 1994, p44). Allen (1997) concurs and notes that in order to provide decision support for planning and the implementation of development it is necessary to have 'models that can capture the creative dialogue between new investments, infrastructure and the chain of responses of the populations and of the environment to these' (page 3).

Models can help the decision making process in a number of ways and different factors motivate the development and use of models. In this context property researchers over the years have produced a range of models which attempt to describe behaviour at this level of development. The models have varying degrees of depth and are generally either predictive or explanatory in nature. These two approaches are at the heart of a debate in property research which is contextually important for the present work and which is discussed in some depth in **Chapter 2.** Much of the modelling work carried out to date examines the broad behaviour of the market and concentrates on describing this in the form of time series statistically correlated equations. These are generally predictive in nature and achieve success by how well output predictions match the subsequent actual value of the variable of interest. However, there is a developing agenda in property research that highlights the limitations of these models in terms of their usefulness in analysing the underlying

processes at work and their ability to provide a comprehensive analysis of market dynamics. Recent work also recognises the importance of understanding the dynamics of urban change

These themes are echoed in modern evolutionary economics where the need to understand change is an important consideration (Andersen, 1996). This is also true of recent work on urban systems (Allen, 1997) which explores the way in which urban and regional structures evolve and change as a result of the multiple decisions of the inhabitants. The systems type analysis undertaken in the thesis allows a start to be made in exploring these issues specifically in the context of the commercial property market and the associated commercial development process.

## SCOPE AND OUTLINE OF THE WORK

### Main Hypothesis and Aims

The thesis examines the hypothesis that the property market, of which the development process forms part, can be conceptualised as a complex adaptive system and places this conceptualisation in the context of existing institutional and other models of the market. It pre-supposes that development and developers, as process and agent, are not autonomous entities and that they find their raison d'etre from within a wider economic and political cultural context. The work therefore focuses on the systems dynamic in and through which development occurs and developers function. Specifically, it looks at *processes* operating in the market place.

A major aim of the work is to bring general systems theory and associated ideas on non-equilibrium structural change to a property audience and to outline the benefits of using a systems based analysis of market behaviour.

## Outline of Work

Following a review of existing models of the property market/commercial development process in **Chapter 2, Chapter 3** reviews general systems theory and the problem of change. It recognises that models are, broadly speaking, post-hoc and in this context, it examines the question of systemic change and evolution. A common fault of all market models is that they describe market structures on a post hoc basis. It is important to recognise, however, that market structures might change. Indeed systems theory suggests that they *will* change and suggests that within a system, at any given level of complexity, there are emergent properties which cannot be readily explained solely by reference to lower levels (structure). The understanding of this type of structural change is crucial if we are to predict future behaviour and in this context the work examines the question of systemic change and evolution in some detail. This type of analysis attempts to place property market research on an equal footing with the concepts being developed and applied in evolutionary economics and with ideas of self-organisation being used in the study of the way cities change and develop noted above. Importantly, it offers the concept of non-equilibrium structural change in a property market context based on the interaction of micro-diversity in system components with the environment across an open systems boundary. It suggests that such a conceptualisation:

- Is beneficial in terms of understanding the behaviour of the market and its reaction to exogenous influences.
- Can strengthen the theoretical approaches of the institutional models by incorporating structure and agency aspects in one model.
- Places the understanding of property market behaviour in the context of wider debates in economic theory relating to evolutionary theories of economic growth.

The types of analysis described above are not possible without an understanding of the existing property market system and its dynamic. **Chapter 4** examines this on two levels. In the first instance it describes a received neo-classical view of market dynamic in systems terms. Although it adopts a main stream economics view of the market, it integrates agents in a structure that reflects the cause, effect and process of market operation. It attempts to reflect the dynamic of the system, lost in other models of the market, using principles of dynamic feedback. On another level, the Chapter also examines structural change in the property market since 1800 using existing historical studies and places this change firmly in a systems context.

The analysis of complexity and change in Chapter 3 highlights the importance of local studies in understanding property market behaviour. In this context, a major study of behaviour in the Edinburgh office market from the mid 1980s to the present has been undertaken and is described in **Chapters 5, 6 and 7.** In keeping with the philosophies outlined above, an important element of the work has been to generate a broader understanding of market dynamics and a better comprehension of the changing character of

property markets. It has attempted to go beyond a simple economic analysis of the circumstances within which the market operates. In particular, it has aimed to develop a better understanding of the dynamics of office provision in Edinburgh.

In the systems context, the study was also interested in differences between the local system and interpretations based on the mainstream economics view outlined in Chapter 4, and whether differences were due to naturally adaptive processes or whether they resulted from economic descriptions being too simplistic.

There are three main strands to the work:

- In **Chapter 5** contextual studies have investigated the pattern of new office build and change of use in the Edinburgh office market over the chosen timescale and placed the dynamics of this provision process in the wider economic and social context. The studies have also examined the impact of rents on provision.
- The results of a major survey of occupier behaviour in the Edinburgh office market are described in **Chapter 6.** This examines factors that impact on the decision to own or rent and on the decision to own or rent a particular building. It also examines a number of management and demand-related issues.
- **Chapter 7** examines the two major office developments in Edinburgh over the period of the study, Edinburgh Park and The Exchange, in the context of the parts played by particular agents in the development process (including The City of

Edinburgh Council, property developers and other property professionals). They also examine the motives and trigger for development.

Finally, simulation as a means of analysing behaviour patterns in a quantitative manner for comparative, rather than predictive, purposes is described. This includes a brief overview of commercially available systems simulation computer software packages and a demonstration of the operation of the property supply/demand cycle using the simulation software *ithink*.

## REFERENCES

Adams, D. (1994). *Urban planning and the development process.* UCL Press, London

Allen, P.M. (1997). *Cities and Regions as self-organising systems: Models of complexity.* Overseas Publishers Association, Amsterdam. Under license by Gordon and Breach Science Publishers.

Andersen, E.S. (1996). *Evolutionary Economics – Post Schumpeterian contributions.* Pinter, London.

Senge, P.M. (1992). *The Fifth Discipline.* Century Business, London

# Chapter 1

# Introduction

CHAPTER 2

# Models of reality – modelling the commercial development process

## INTRODUCTION

Property researchers have shown a continuing interest in understanding and modelling the behaviour of the commercial property market and such models have enjoyed growing use and importance over the last twenty years. Different factors motivate the development and use of models. In this context, Bauman and Groth (1996) broadly categorised models as either explanatory or predictive. Their particular context was economic models but the classification and underlying idea is equally applicable to all models. Thus, explanatory models can be used to characterise and/or offer insights into the relationships which support a better understanding of cause, process and effect whilst predictive models achieve success by how well output predictions match the subsequent actual value of the variable of interest.

Much of the modelling work in property research has examined the broad behaviour of the market and has concentrated on describing this in the form of time series statistically correlated equations. These use statistical methods to examine the impact of a variety of economic factors on market behaviour. Such mathematical models of behaviour are important in that they have the ability to represent the relative influence of a range of factors that affect behaviour and provide a powerful tool for explaining the main features of

property cycles. However, there is a developing agenda in property research which highlights the limitations of these models in terms of their usefulness in analysing the underlying processes at work, and their ability to provide a comprehensive analysis of market dynamics (for example see Barber, 1994; Henneberry, 1995; Cundell & Harris, 1995; Guy & Harris, 1997; Keogh & D'Arcy, 1994; D'Arcy & Keogh, 1997; Guy & Henneberry, 2000). Guy & Harris (1997) argue that the goal of property research should be more than prediction and that there is a strong case for work which provides more comprehension and explanation of the changing character of property markets. In addition, there is a need for a more broadly based agenda which goes beyond conventional market analysis based largely on economic fundamentals and which should include (Keogh & D'Arcy, 1994) issues such as:

- The characteristics of local real estate culture
- The use and misuse of market information
- The market rationale of the functions performed by professionals.

D'Arcy & Keogh (1997) also recognise the need to supplement traditional explanations of urban change with an explicit consideration of the operation of property markets in order to facilitate a deeper understanding of the contemporary European experience of urban change. In keeping with the systems view outlined later, they note that changes in the economic and spatial structure of urban regions are inevitably shaped by real-estate market dynamics. In addition, they note that property market structures, and the legal and policy context within which these markets must operate, are factors which do not passively adapt

to changing user requirements. Instead they play an important role in determining the degree to which the built environment responds to the forces of structural change. In order to understand urban change, *the constraints imposed by the operation of the property market*, and the way it functions, must first be understood. By omitting an explicit treatment of physical property and property market process conventional analysis of urban economic activity and change provides an incomplete explanation of restructuring and adjustment in the urban economy. Guy and Henneberry (2000) argue for the need to develop an understanding of property development processes which combine a sensitivity to the economic and social framing of development strategies with a fine grain treatment of the locally contingent social responses of property actors.

These themes are echoed in modern evolutionary economics where the need to understand change is an important consideration (see below and Andersen, 1996). This is also true of recent work on urban systems (Allen, 1997) which explores the way in which urban and regional structures evolve and change as a result of the multiple decisions of the inhabitants.

The review in this Chapter has been undertaken with the above debate in mind and undertakes to put the debate and the later systems work in context. It is comparative in this sense and does not attempt to undertake a detailed assessment of each individual model. It includes conceptualisations of both the property market and the commercial development process. The property market here is understood as the production and exchange of commercial property whether through the provision of new property or exchange of

existing property in the market place. The Chapter is mainly concerned with the former, also known as the *commercial development process*, but factors are common to both and each impinge on the other. In this context, economic models that attempt to describe the cyclical behaviour of property market indicators are also outlined briefly. Consistent with the systems model considered later and consistent with the majority of commercial development in the UK, the review limits itself to models of the market in which ownership and occupation are separate. It recognises that such models are, broadly speaking, post-hoc and the Chapter therefore examines the notion of systemic change and evolution before a full discussion of the issue in Chapter 3.

## APPROACHES TO MODELLING

A variety of models exist which have been devised to assist in a variety of contexts and which are based on different theoretical underpinnings. Six main sources have been used to review these models - Gore & Nicholson (1991); Healey (1991); Adams (1994); Ball (1998); Ball et al (1998) and Key et al (1994). The reader is referred to these reviews for detailed explanations.

Although the models take a number of different forms a broad classification of types is possible. Healey (1991) identifies four broad approaches:

- **Equilibrium models**, which assume that development activity is structured by economic signals about effective demand, as reflected in rents, yields etc. These derive directly from neo-classical economics.

- **Events sequence models,** which focus on the management of stages in the development process.
- **Agency models,** which focus on the actors in the development process and their relationships and which seek to describe the development process from a behavioural or institutional[1] point of view.
- **Structural models,** which focus on the forces that organise the relationships of the development process and which drive its dynamic. These are grounded in urban political economy.

Healey notes that the first three classes of models represent different ways of developing the analysis of actors and institutions operating in markets structured by the demand and supply of commodities whilst the fourth approach is based in theorisations of the structure and dynamics of commodity production and exchange. Gore & Nicholson (1991) do not include equilibrium models in their classification but recognise the others. In addition they recognise the so-called **structures of provision** approach developed by Ball in the late 1980s (see later – the conceptualisation attempts to reconcile the structure and agency aspects of other models). Of all the models, it is probably true to say that only equilibrium models (and then only some of these) attempt to be truly predictive whilst the remainder tend to be post-hoc rationalisations of market processes.

[1] Ball's (1998) preferred definition of the term institutional is "the firms, public bodies and other agencies associated with property development".

The four classifications by Healey (1991) have been used as the basis for the descriptive work below. Within this classification there is another broad grouping based on main stream economic and Marxist interpretations of behaviour (see Guy & Henneberry, 2000). Such groupings will be highlighted in the text where appropriate. There is another broad grouping based on institutional forms of analysis which cut across the four main groupings noted above. Institutionalism incorporates aspects of main stream economics, structure and agency as well as structures of provision. Because of the importance of institutions in the commercial development process, the spectrum of institutional analysis is considered as a separate category and the structures of provision approach is included within its ambit.

Interestingly, econometric models of market behaviour are not included in five of the six main reviews, although economic structure models are. There is no clear reason why this is so and the omission is rectified in the analysis below.

## EQUILIBRIUM MODELS

The assumption of these models is that the development process is driven by the demand for new property. It contends that individual decisions are made within a market framework. Development activity is initiated by demand, to which supply responds to produce development at the right time and the right place. Actors therefore define and pursue their strategies, interests and actions within a context set by market signals, in particular by the price mechanism through which supply and demand are brought into equilibrium (Adams, 1994, p66). Healey (1991) notes that, generally speaking, development activity itself is seen as relatively unproblematic with transactions and investment activated by market signals related to land and property prices and rents.

Keogh, 1994, (Figure 2.1) analyses use and investment in the property industry in these

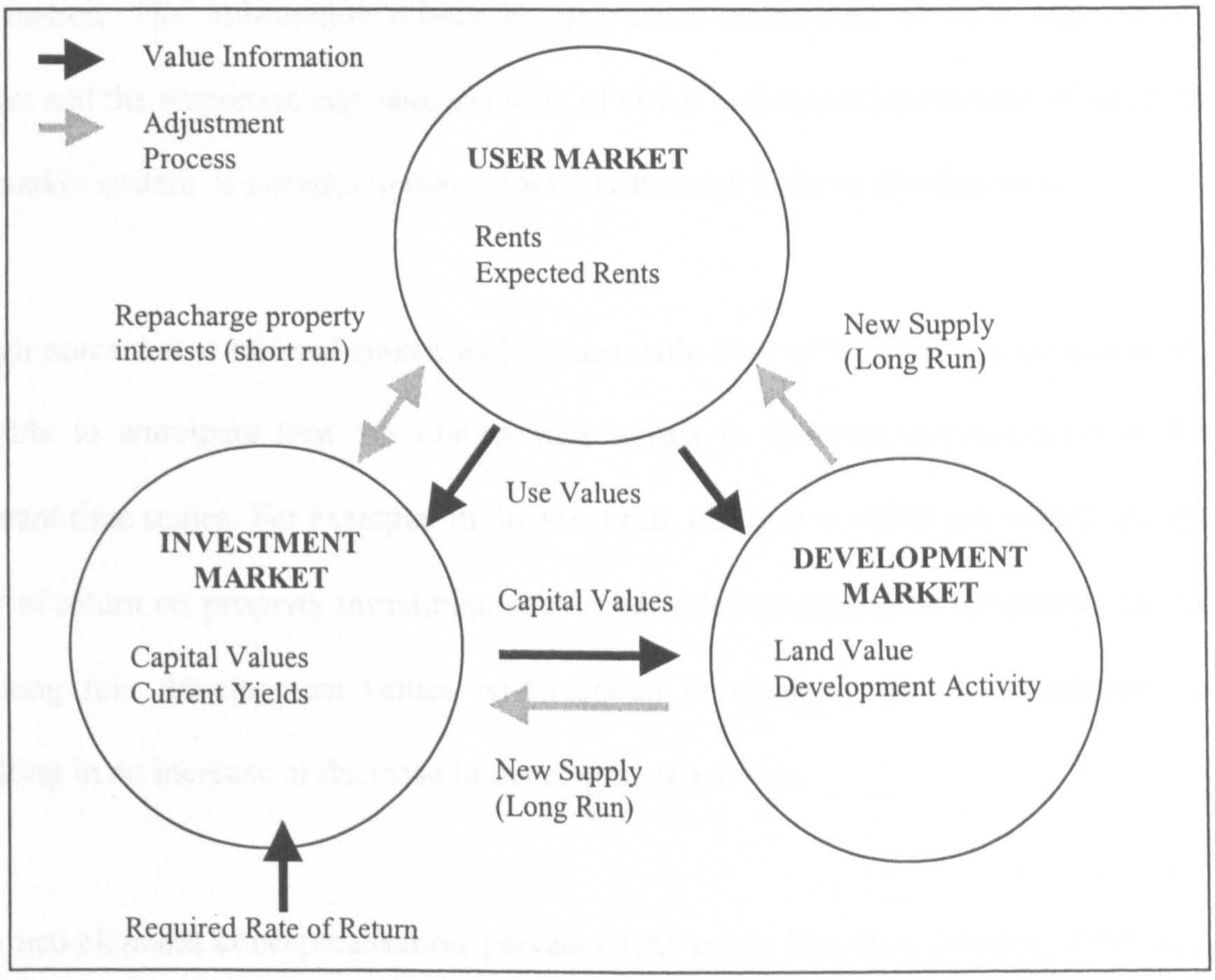


**Figure 2.1. Use and investment in property markets (Keogh, 1994).**

equilibrium terms. Although it does not set out to produce a model of the property market/commercial development process the work provides a useful simplification of the processes involved. The separation of the market into the three main functional components of use (occupier), investment and development reflects the way the market commonly distinguishes between the right to use property and the right to hold a purely financial investment interest in property. The third element, development, is noted as being conceptually distinct but crucial to the explanation of use and investment markets. Each component of the model represents a market area where trade occurs and prices are determined by the interaction of supply and demand. The three elements are linked by the

flow of information between them and the adjustments that occur in response to that information. The information relates to the values established in each segment of the market and the responses may take the form of either a simple reassessment of value across the market system or changes in market activity through trade or development.

Keogh notes that if rational choice and a reasonable flow of information are assumed it is possible to anticipate how the market may adjust in different circumstances and over different time scales. For example, in the short run, changes in either use values or required rates of return on property investment should be reflected rapidly in investment values. In the long run, development values will respond to changing use or investment values resulting in an increase or decrease in development activity.

This neo-classical conceptualisation pervades real estate literature (Healey, 1991 and, for example, see Harvey, 1996 and Fraser, 1993). Ball, 1998, prefers to call it a mainstream economics approach, a term that will be adopted here. It is the basis of much of the econometric modelling described below. Thus, the concept of utilities and observed behaviour based on rational, predictable decision making processes, coupled with the concept of movement from one equilibrium situation to another, has allowed mathematical models to be built describing how similar individuals faced with a series of economic choices might react (Allen, 1997). However, this vision of equilibrium with individuals and organisations having clear responses to events that are perceived with absolute clarity is not one that normal people would recognise as corresponding to reality. Having said that and recognising that the approach is littered with imperfections which restrict the ability of

actors to respond in a perfect way to the market, it represents one useful broad approach and is used as the basis of the systems structure described later.

## Econometric Models

Econometric models of market behaviour use statistical methods to distil a set of correlations between factors (e.g. GDP, interest rates, prices, price inflation, new development, etc). They blend together such sets of macro-economic data using appropriate statistical weightings to track the behaviour of the dependent variable of interest. They attempt to explain the movement of a time series by relating it to its own past values and to a weighted sum of current and lagged random disturbances (Pindyck & Rubinfield, 1998 p521). Generally speaking they are correlational and predictive in nature although it can be argued that curve fitting, by implication, may add an explanatory aspect to the models. Thus, some analysis is required in order to make judgements about which explanatory variables to include, the functional form of the equation, how the statistical fit of the model should be interpreted and how useful the resulting model is for forecasting or explanatory purposes (Pindyck & Rubinfield, 1998). Numbers, however, dominate the output and they say little on process and the dynamics of change. Such models by considering demographic, economic and environmental processes in play at a given time may appear to offer deterministic predictions covering the future, assuming different policies or exogenous event. However, they can only be correct for as long as the qualitative structure of the system to which they relate remains unchanged. In a sense, they may be described as 'financial score keeping systems'. Three broad types of model can be identified (Pindyck & Rubinfield, 1998):

- **Time Series Models,** which presume to know nothing about the causality that affects the variable that is being forecast. Instead, the past behaviour of a time series is examined in order to infer something about its future behaviour. The method used to produce a forecast may involve the use of a simple deterministic model such as linear extrapolation, or the use of a complex stochastic model for adaptive forecasting.
- **Single Equation Regression models,** in which the variable under study is explained by a single function (linear or non-linear) of a number of explanatory variables. The equation will often be time dependent so that the response over time of the variable under study to changes in one or more of the explanatory variable can be predicted.
- **Multi-Equation Models,** in which the variable to be studied may be a function of several explanatory variables, which are now related to each other, as well as to the variable under study through a set of equations. The construction of such a model begins with the specification of a set of individual relationships, each of which is fitted to available data. Simulation is the process of solving those equations simultaneously over some range of time. It is such models that come closest to being explanatory as well as being predictive since they attempt to say something about structure through the multi relationships described.

**Econometric Modelling of Property Market Behaviour**

Virtually all of the models in this category attempt to describe the cyclical character of the post-war property market. Property cycles essentially describe the fluctuations in activity and values in the property sector, including development cycles and other property factors.

Key et al (1994) define them as "recurrent but irregular fluctuations in the rate of all property total return, which are also apparent in many other indicators of property activity, but with varying leads and lags against the all property cycle".

The nature of these cycles is illustrated in Figures 2.2 and 2.3 which show respectively the cyclical nature of construction orders and the variation in all property total return and its

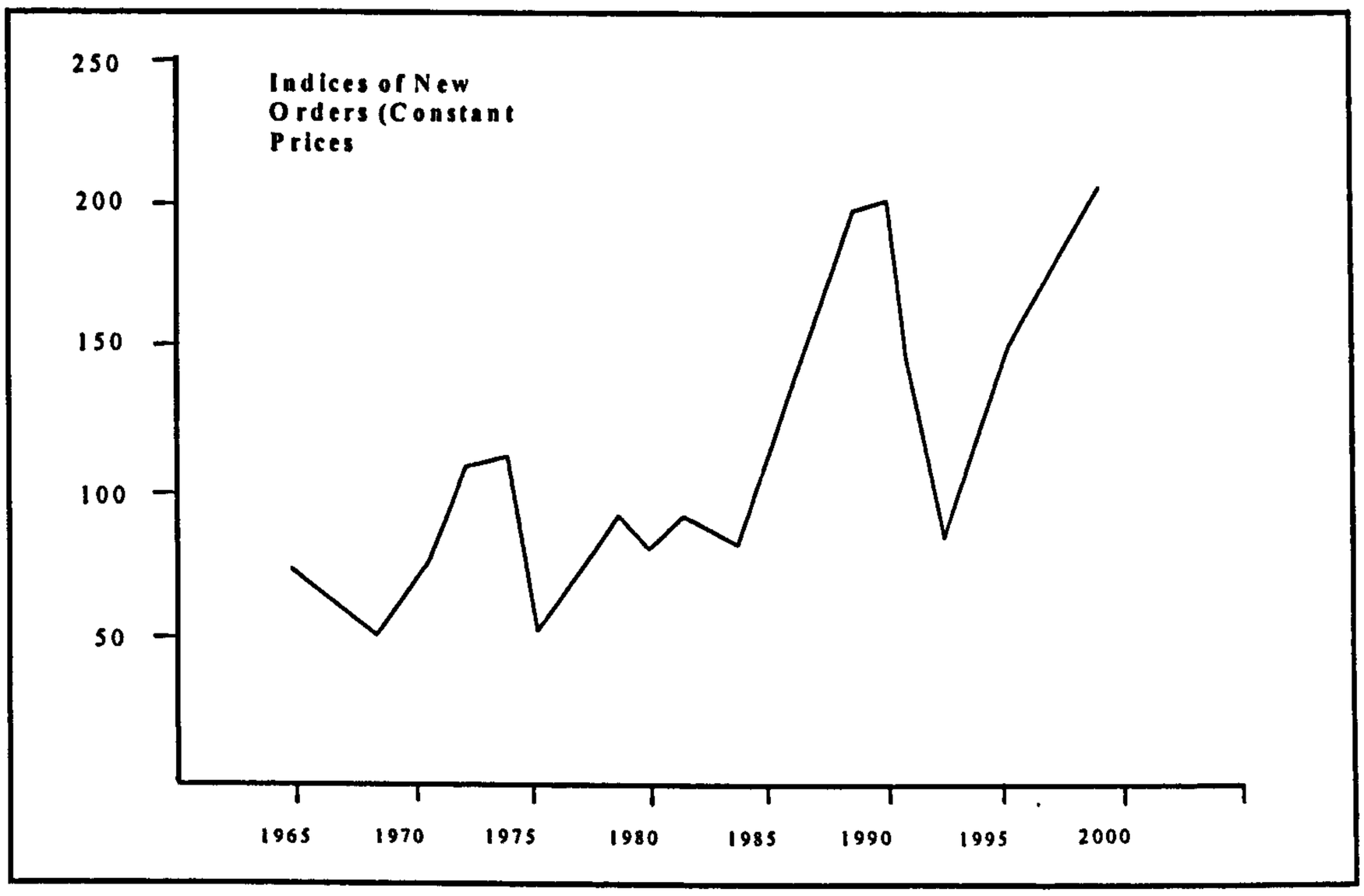


**Figure 2.2. The Building Cycle (IPD from DETR Construction Statistics)**

components.

A range of studies have been carried out to verify and establish the nature and incidence of these cycles (see Appendix 1). They include time series models, single equation regression models as well as multi-equation models and fall into three main categories:

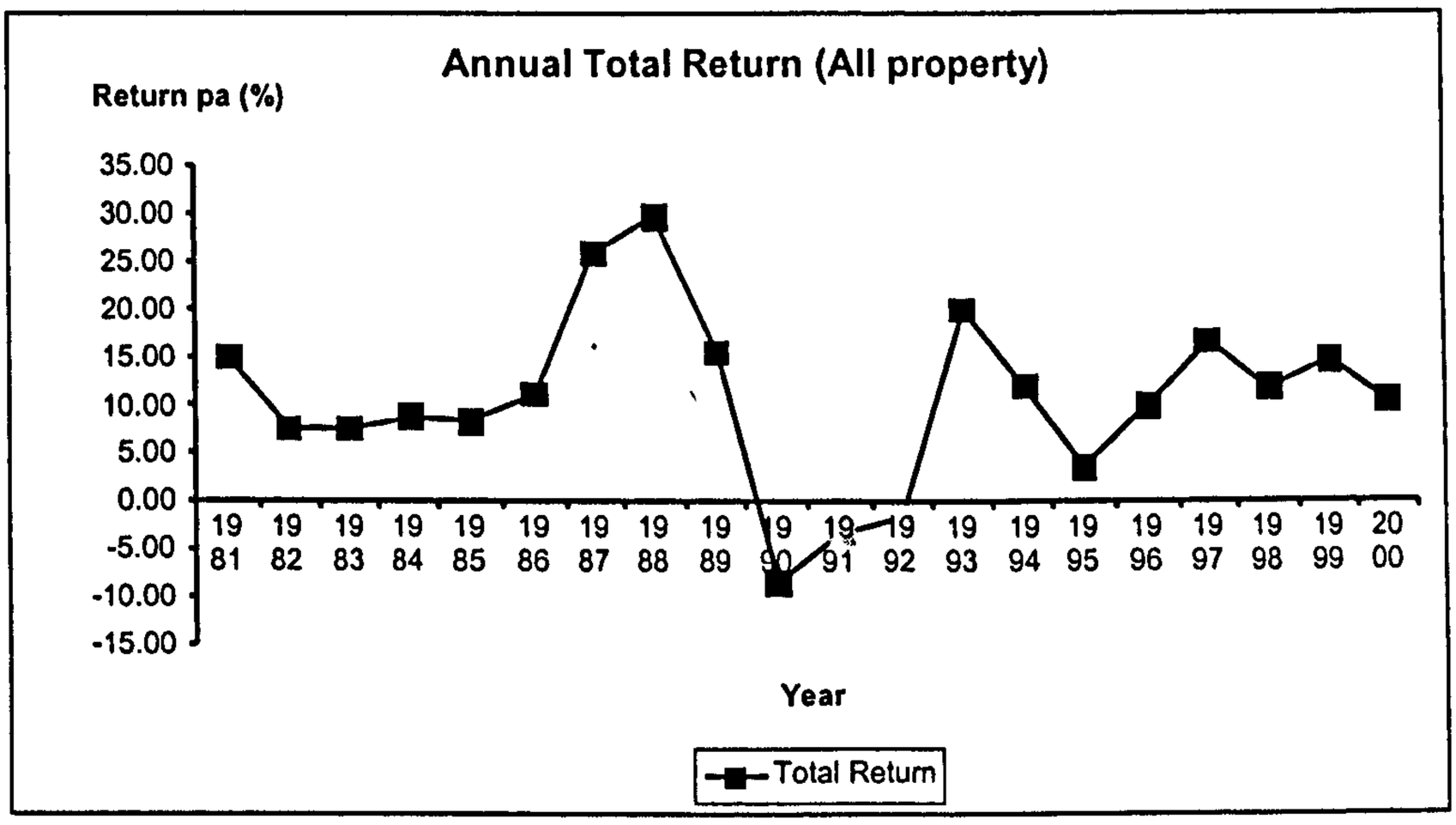


**Figure 2.3. All Property Total Return (IPD)**

- Those which attempt to demonstrate by statistical methods the cyclical nature of the property industry whether in terms of building cycles or property indicators.
- Those which attempt to verify and quantify the perceived links of property to the overall economic cycle as necessary precursors to the third type viz:
- Those which statistically analyse the market in terms of endogenous factors and exogenous macro-economic factors.

The work linking the economy to the property market and the commercial development process (in terms of the pattern of new build) has important implications with respect to the present study. Almost ubiquitously these economic studies use GDP or some related derivative as proxies for a measure of a variety of variables, not the least as proxies for demand side variables. They aggregate and to some extent obscure the processes at work and although they allow a statistical interpretation of behaviour they do little to explain the structural processes. There is a danger of misinterpretation when using proxies. Thus

Keogh (1994) notes that care should be taken in interpreting GDP as a determinant of rents. Whilst GDP is important there are difficulties associated with estimating simple rent equations on the basis of national or regional output. Slater (1996) also cautions the blind use of GDP in predicting changes in rental levels. Such forecasting produces conservative results giving less rental growth in booms and less dramatic falls in down sides of the cycle. The use of GDP, however, can be 75% successful in ascertaining the direction rental levels move on the previous year.

Having said that, these models are important in that they have the ability to represent the relative influence of a range of factors that affect behaviour and provide a powerful tool for explaining the main features of property cycles overall. They are less useful for analysing the underlying processes and do not provide a comprehensive analysis of market dynamics. Thus, Henneberry (1995) notes that whilst they offer a powerful explanation of the main features of property cycles, the underlying models are mechanistic in the way they capture and describe relationships and, once finalised, produce results deterministically. Attention is focused on inputs, model specification and outputs rather than on processes. Furthermore, Cundell & Harris (1995) note that whilst it is true that the assumptions are clearly laid out, no explanations of how the variables are handled is offered, what relationships are derived or assumed and what weightings are attached.

It is the above types of argument that are at the heart of the modelling debate noted in the introduction to this Chapter. It is not that econometric/statistical models have nothing to say about the property market, in fact the reverse is true, it is the importance that is given to

them by many property professionals at the expense of perhaps more qualitative explanatory models. The latter should form the starting point for the former.

## EVENTS SEQUENCE MODELS

Events sequence models describe the process of development in a time sequential manner. They are behavioural rather than mathematical in emphasis and are explanatory rather than predictive in nature. A number of conceptualisations exist in this category:

### Linear Models

Gore and Nicholson (1991) note that the most straightforward depiction of the development process is the short verbal summary of its principle stages provided by Cadman & Austin-Crowe (1978). They divide the process into four phases:

- Evaluation
- Preparation
- Implementation
- Disposal

The model has been seen as being too loose and general to do no more than simply trace some of the events that form the path a project might take through the process (Gore & Nicholson, 1991, p 706). The popular way of refining such verbal descriptions has been the representation of the development process as a flow diagram and Gore & Nicholson note the linear sequence of events and decisions mapped by Ratcliffe, 1978, for property

development in general, and by Punter (1978) for office development. Whilst better than the simple description of process given by Cadman & Austin-Crowe, such linear models, which postulate the development process as a rigid, sequential, process with a definite beginning and end, "fail to capture either its cyclical nature or the diversity and flexibility that characterises the development industry" (Gore & Nicholson, 1991, p 709).

## Dynamic Models

Barrett et al (1978) and Gore & Nicholson (1985) themselves address the issue of linearity.

### *Barrett et al (1978)*

These authors introduce the concept of the development pipeline as a means of appraising research on land policy and development. Within this development pipeline they group activities and decisions into three sets of events, each one corresponding to one side of a triangle (Figure 2.4).

Development Pressure.

The initial stages of the process are concerned with the need or demand for, and supply of, land and buildings for a variety of uses (Gore & Nicholson, 1991, p 709). Activity in the development pipeline only begins when it is triggered by broader economic, political and demographic factors. These external influences are depicted outside the pipeline. Economic growth, taxation incentives and the impact upon land requirements of long term trends in population growth, household formation and associated factors, may all create development pressure and prospects.

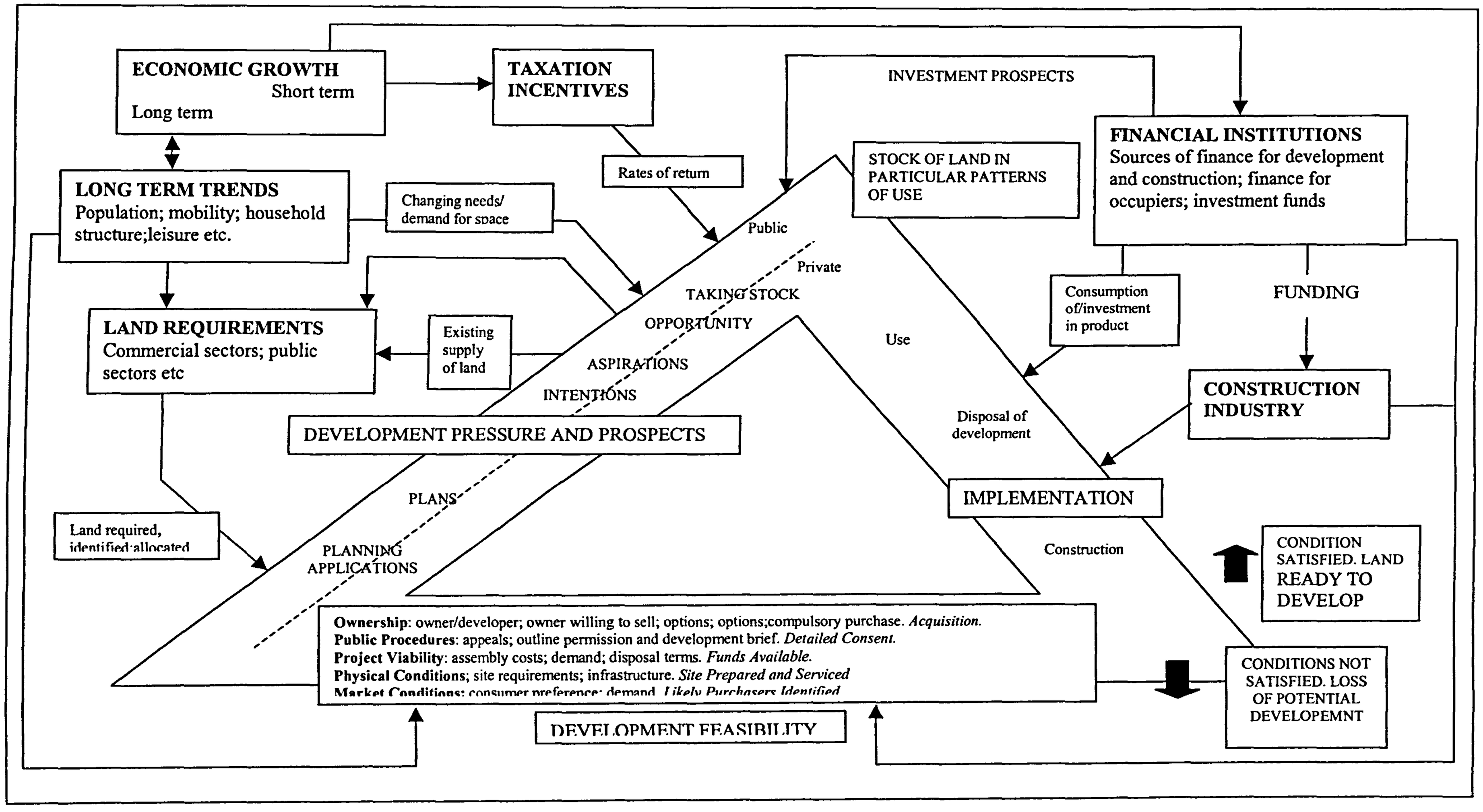


**Figure 2.4. The development pipeline model (Barrett et al, 1978)**

Development feasibility.

This covers all those events that must occur between the identification of suitable sites, or profitable projects and the commencement of production. Five parallel streams relating to different influences or constraints exist (ownership, public procedures, project viability, physical conditions and market conditions). Adams (1994) analyses these streams in some depth. Of note in his analysis are:

- **Active and passive land ownership**. The motives and behaviour of owners significantly influence development prospects. If owners of land with development potential are unwilling to sell, passive land ownership may become a serious constraint to development. Although local planning authorities may initiate compulsory purchase action in such cases, many are reluctant to do so for administrative, political or financial reasons. Whereas active landowners may welcome or initiate development (and participate enthusiastically in local plan preparation in order to seek the most beneficial allocation of their land), passive landowners can undermine development potential (a detailed behaviourist analysis of land ownership is given in Adams[2], 1994, Chapter 5). Such issues have been found to be extremely relevant to the two large office development schemes discussed in Chapter 7 of this work.

---

[2] Adams notes that despite public fascination with the ownership of land, the contribution of the land owner to the development process has been relatively neglected for two reasons:

(a) In neo-classical theory the supply of land is considered to respond to demand pressure, enabling land to move into its most profitable use.

- **Public procedures.** The importance of planning and the attitude of the planning authority to the development process.
- **Project viability.** The importance of a viability study to determine whether expected revenues are likely to exceed expected costs by enough to produce the desired rate of profit. Changes in economic activity, interest rates etc during the course of the project may significantly change the initial viability assessment.
- **Physical conditions.** The importance of ensuring that the identified site can accommodate the proposed development in physical terms.
- **Market conditions.** The importance of monitoring market conditions right up to the start of development and the possibility that macro-economic conditions might alter sufficiently to cast doubt on the feasibility of the proposed development.

Implementation.

This is where development actually takes place and involves not only the process of construction but also subsequent disposal, management and use. It has links to external factors via the funding institutions.

Although the model is shown as a triangle, in practice it operates as a spiral, producing a fresh pattern of land use at the end of each cycle. It highlights the dynamic nature of the development process in which the relationship between factors such as taxation and viability may change from one cycle to the next and produce different outcomes in the built environment (Adams, 1994, p 48). Thus, from a systems view, it attempts to represent a

(b) A widespread misconception exists that urban planning has diminished the role of the landowner in the supply of land.

feedback process (the spiral dynamic), albeit in a limited sense. The model also allows the progress of activities connected with projects, sites, developers or other actors to be traced within the development process as a whole and indicates the points at which the principle external factors impinge upon the process.

Notwithstanding these advantages, Gore & Nicholson note the weakness of the model in:

- Not differentiating external factors (or defining the way in which they influence the development process - compare the aggregation of the effect of economic conditions on demand in the mathematical models).
- Assuming unproblematic land supply.
- Excluding other external factors that might be expected to impinge on the development process such as central and local government policies.
- Being mainstream economics based and focusing exclusively on private development and stressing the importance of market conditions.

***Gore & Nicholson, 1985.***

Gore & Nicholson themselves (1985) extend this model to include adjustments to take account of the differences between public and private development (Figure 2.5). This model also identifies a wider range of possible external factors.

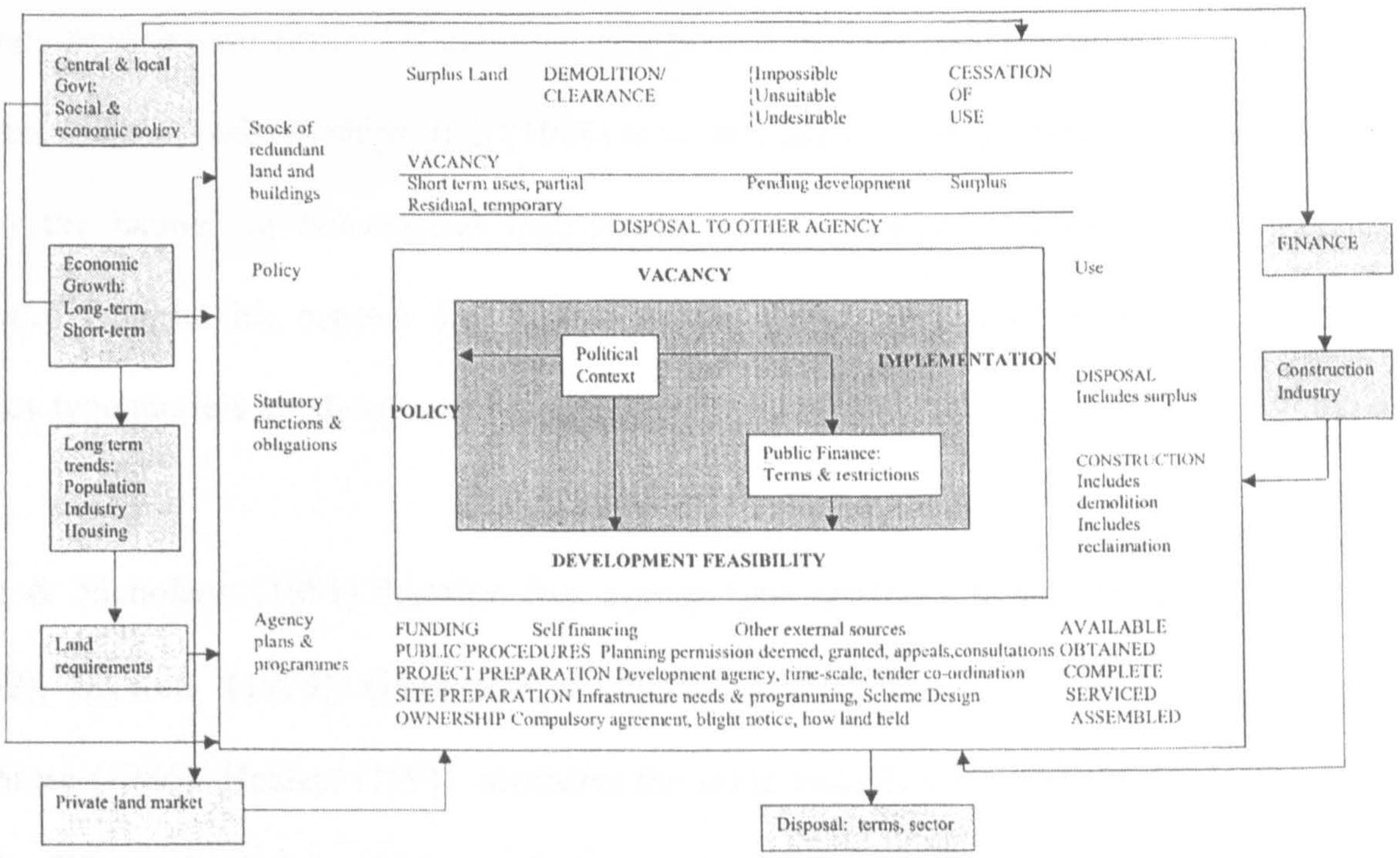


**Figure 2.5. An events based model of the public sector development process (Gore & Nicholson, 1985)**

In conclusion it may be said that sequential models provide some useful preliminary insights into the workings of the development process although they do not capture fully the variability of development and its 'integral relationships' (Gore & Nicholson, 1991). Interestingly, from a systems viewpoint, Gore & Nicholson note the fairly rigid confines of the models and the subsequent limitations in terms of this 'closed systems' approach. However, they do lay out the actions taken during the development process and begin to unravel dynamic causal links, although they do not attempt to analyse the underlying dynamic.

## AGENCY MODELS[3]

Agency models, are firmly behavioural in approach and concentrate on the actors in the process and their relationships. Ball (1998) discusses agency and its impact on development under the banner of behavioural institutionalism and further discussion of agency is included later in this context. For now, only the broad concept of agency and specific agency type models are discussed.

Gore & Nicholson (1991) describe five agency type models - those due to Bryant et al (1982), Drewett, (1973), Goodchild & Munton (1986), Barret & Whiting (1983) and Ambrose (1986). Healey[4] (1991) considers the same models and in addition considers the work of Kaiser & Weiss, (1970) and includes within this classification the model of Barrett et al (1978), already discussed under events sequence models. Some of these 'models' are no more than sketches of the development process identifying actors at different stages of the development. The reader is referred to the original papers and to the reviews noted above for a detailed analysis.

Byant et al (1982) identify primary agents who have a direct interest in the land to be developed including farmers, developers, builders and occupiers (Figure 2.6). Secondary

---

[3] Classified as behavioural or decision making approaches by Gore & Nicholson, 1991.

[4] Healey (1992) also includes work that analyses the detailed roles of specific actors (rather than models that give an overview of the actors and their interactions). Thus she includes the work of McNamara (1988) and Massey and Catalano (1978) which make detailed observations concerning developers and landowners. The reader is referred to Healy (1991) for a detailed summary of this work. It is worth noting here, however, McNamara's distinction between short term (entrepreneurial), long term (leasing out) and long term (owning and occupying) developers.

agents, who have an indirect interest in the land, were also identified. The latter included planners, politicians, lawyers, property agents financiers. In analysing the model, Gore & Nicholson (1991) suggest that there is no consideration of the impact of external factors on decision making or of the relationships between the

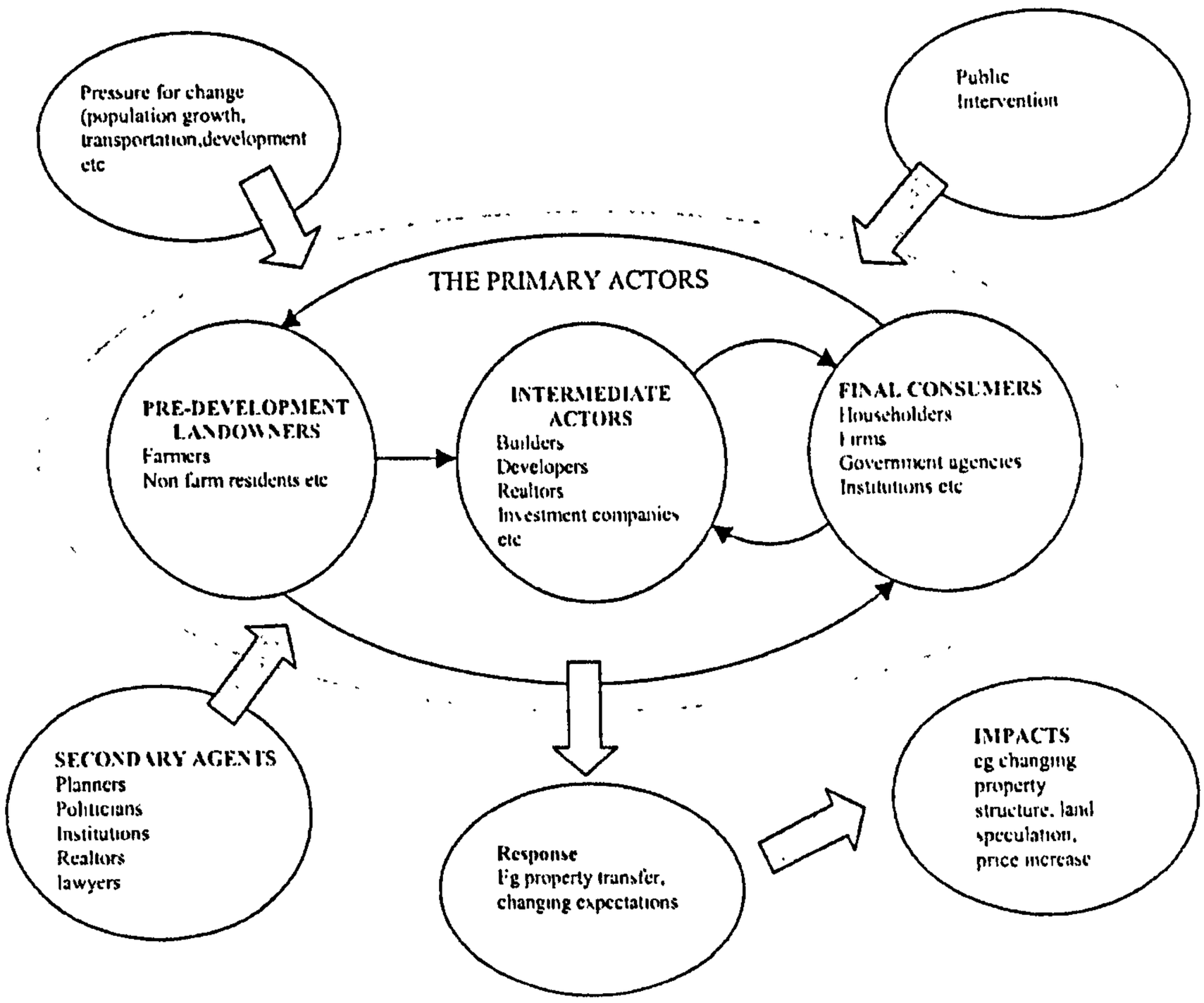


**Figure 2.6. Agents in urban fringe land markets (Bryant et al, 1982).**

actors. However, the diagram presented by Bryant et al (above) suggests that whilst the former might be true the latter represents an unfair criticism. Indeed, there is not only a consideration of relationships but also some consideration of feedback in a system with a defined boundary.

Drewett (1973) sketches the relationships between interested agents in the development of rural land. The developer is seen as the link between primary agents in the land development process and the model excludes, or at least restricts, the agents involved. It is of limited use in terms of the present study and the reader is referred to the above reviews and the original paper for further details. A similar approach was taken by Kaiser & Weiss (1970) and is reproduced in Figure 2.7.

| Sequence of states | 1 Urban Interst | 2 Active consideration for development | 3Programmed for development | 4 Active development | Residence |
|---|---|---|---|---|---|
| Description of state & decision agent | The land has development potential and existing use becomes transitional | A developer and land owner have contacted each other regarding the possible sale or purchase of the land | A developer has a definite idea of the timing and character of development | A developer has begun physical development of the land | A household has purchased the residential package of house and plot |

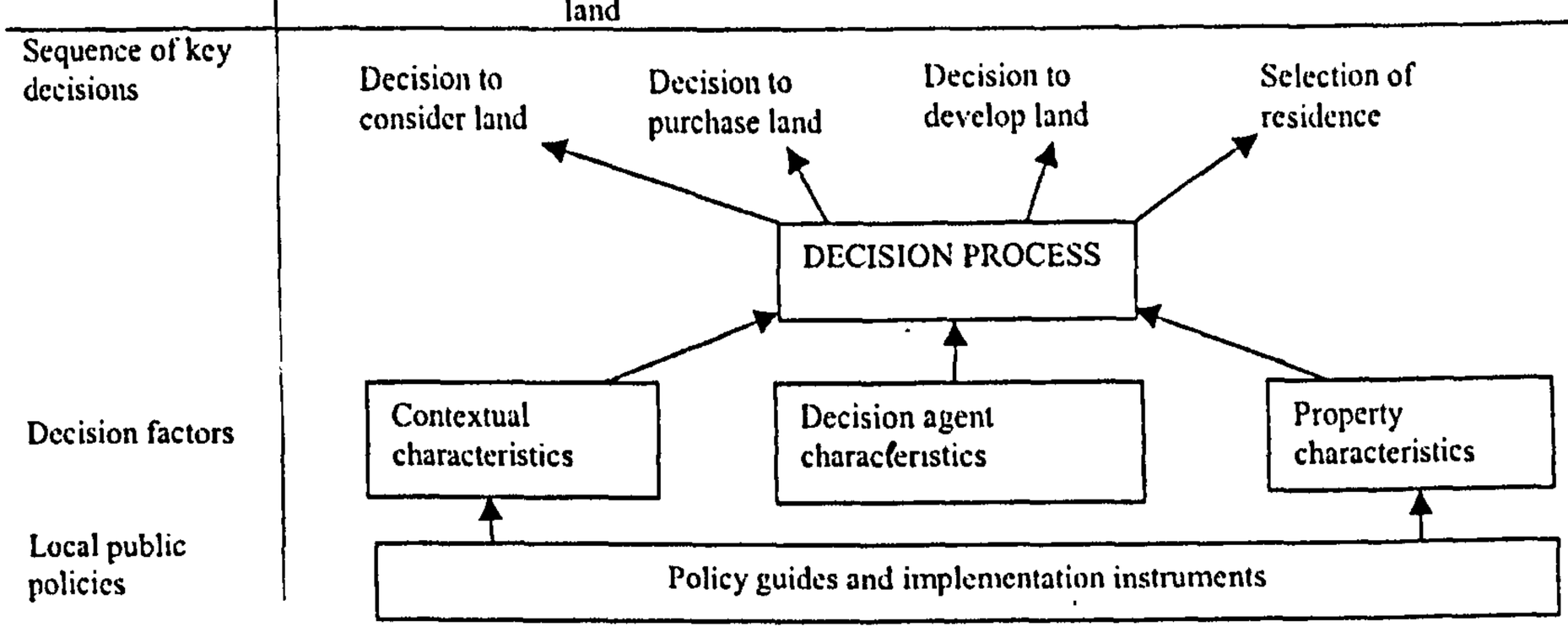


**Figure 2.7. Kaiser and Weiss' (1970) model of the residential land conversion process**

Goodchild & Munton (1985) present a descriptive model which relates actors to events and which identifies alternative event sequence routes. At certain stages it includes decision points where key player have to decide whether to proceed or not. Gore & Nicholson note that the model strongly underlines the variation in the roles performed by different actors according to the different routes that may be taken by a development site through the

process. However, they note that it cannot cope with redevelopment schemes or refurbishment of life expired buildings. In addition, from a systems viewpoint, no place is found for the effects of external factors on development. Healey (1991) notes that it does not assist in analysing what might affect the strategies of the various actors at different stages and what might give rise to different routes and mainly for this reason is considered no further here.

Barrett & Whiting (1983) attempt to analyse the interactions between actors in the development process in their study of the involvement of English local authorities in land supply. They consider five principle actors (developer, funder, builder, professional advisers, including financial and legal, and the public sector) responsible for the regulation of land use and the provision of infrastructure (see also Gore & Nicholson, p 718). Importantly, they note that many functions may be combined (e.g. developer and funder, builder and developer) and that the process may actually be considered as a series of functions or activities that bring together resources and the agents that control them. They conclude that the development process is made up of a series of interactions and transactions between the various actors involved. These take the form of negotiations over the sharing of rewards from a successful project in relation to the resources that have been contributed towards its achievement. In this way the model not only covers the interests and objectives of the different actors but also their attitudes towards risk and reward. The model is descriptive and lacks specific detail about who does what and when. In addition, it does not provide a contextual setting for the interactions and external factors are not considered apart from those noted above in term of the relevant actors in the process. It does, however

provide a mature and flexible view of the development process not limited to one type of development, rather than a "rigid and static picture of an idealised process" (Gore & Nicholson, 1991, p 718). It is particularly relevant to the present work which also takes the functional view of the actors involved in the development process and concerns itself with functions and inter-relationships rather than actors per se.

The final model discussed in this category by Gore & Nicholson is that due to Ambrose (1986). This attempts to redress the contextual failings of Barrett & Whiting (1983) by delimiting the *boundaries* of what he terms the *development system* (see Figure 2.8 simplified for clarity but showing the main elements of the model).

This is virtually the only model in any category that conceptualises the development process as a system, albeit on a limited scale and without the benefit of a methodology based on the systems approach.

According to Ambrose the development system consists of three main fields:

- The state.
- The finance industry.
- The construction industry.

The general public and informal pressure groups seek to influence these fields from the outside. The purpose of the model is to set out the principle relationships that exist between the three main fields or sets of agents and between the agents themselves. The eventual

collective output of these processes of negotiation is the new or renewed built environment (see also Gore & Nicholson, 1991, p719 and Adams, 1994, p55).

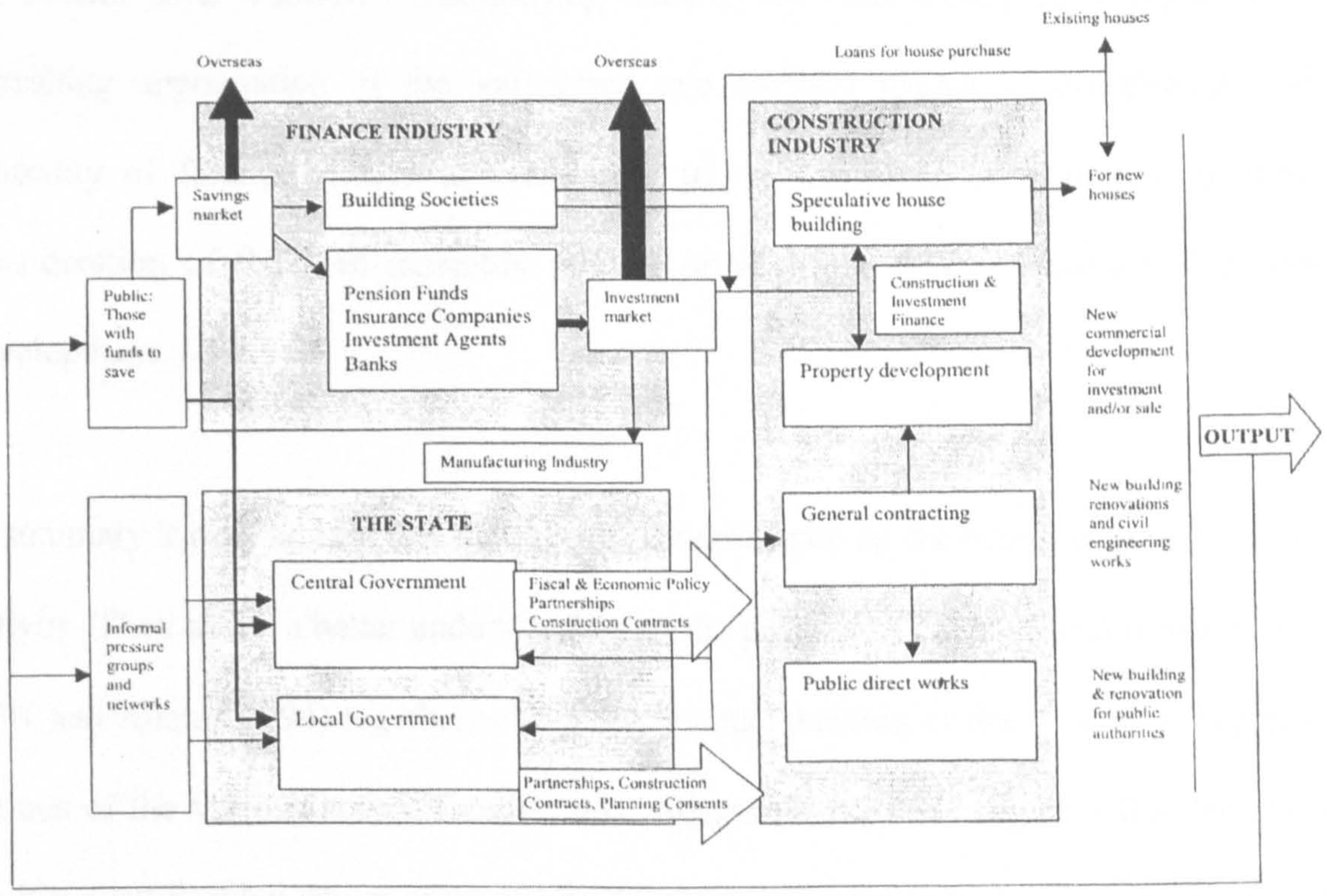


**Figure 2.8. The development system in the UK (Ambrose, 1986)**

Like Barrett and Whiting (1983), Ambrose's development system tries to identify separate functions rather than mutually exclusive actors or organisations. Any particular individual or organisation may undertake more than one role or function e.g. planning officers in local government are also members of the public and may invest their savings in the finance industry (Adams, 1994, p55). In addition, Ambrose compares the model to the wiring diagram of a house that produces no light or heat until it is switched on. The development system is energised only as money, political influence or some other form of interaction flows along the linkages that connect the various elements. These flows are produced by contractual, statutory or informal relationships.

In a manner which resonates with the systems approach, the Ambrose model "focuses on the system as a whole.....the stifling linearity of other examples is replaced with a refreshing appreciation of the variegated and cyclical nature of the process and the centrality of finance" (Gore & Nicholson, p719). However, it continues to omit any consideration of the land assembly process or the finer detail of the actual process of development.

In summary it may be said that that agency models open up the complexity of development activity. They allow a better understanding of the process of development (see also Healey, 1991 and Adams 1994) together with a better understanding of the strategies, interests and actions of the various actors. Despite this, Adams (1994, p55) suggests that they "cannot readily identify what drives or generates development activity in the first place, and cannot thus explain why the production of the built environment varies continuously in form and quantity from place to place and over time". Barrett et al (1978) contend that the development process is triggered by external factors such as economic growth, but "the precise means by which such factors initiate development remains unclear" (Adams, p57). Healey (1991) also notes that they lack a dynamic conception of the forces that might drive the development process. Notwithstanding these criticisms, there is no question that they are far more revealing than the equilibrium models discussed earlier and provide an insight to the market system which is drawn on later in this work. In particular, the work of Barrett & Whiting and Ambrose have made three important philosophical contributions to the overall conceptualisation of the development process:

- The idea of a development pipeline.
- The first steps towards the conceptualisation of the process as a system.
- The concept of a process which needs to be energised in order to reproduce the built environment.

Finally, it is worth noting Adams remark (1994, p65) that in the final analysis actors in the development process never define and pursue strategies, interests and actions entirely on their own. To a greater or lesser extent the performance of each is linked to that of others and, more importantly, the way in which particular actors behave is set within a broader context, known as structure. This is discussed in the next section.

## STRUCTURE MODELS

Structure models identify the forces which determine relationships in the development process and which drive its dynamic. Structure in this context is typically defined as the economic, political and cultural framework within which actors define and pursue their strategies, interests and actions, and which frames their decision making. (Adams, 1994). It can be argued that in reality structure cannot be divorced from agency. The distinction is made here for the purposes of understanding the factors that both influence behaviour and the structure/agency relationship discussed in the next section.

The concept of structure noted above is different from the systems view of structure. Systems theory views systems as feedback processes having orderly structures in the sense of key relationships which influence behaviour over time. The system structure generates

dynamic behaviour (Forrester, 1969). The concept is less deterministic than that described in structure models of the market and incorporates agents and their role in the market process.

Two opposing views of structure have traditionally existed, the mainstream economics view and the Marxist economics view.

**The Mainstream Economics View.**

As noted in the section on Equilibrium Models and reiterated here for clarity, main stream economics contends that individual decisions are made within a market framework. According to this approach, development activity is initiated by demand, to which supply responds to produce development at the right time and the right place. As noted, actors define and pursue their strategies, interests and actions within a context set by market signals, in particular by the price mechanism through which supply and demand are brought into equilibrium.

**The Marxist View**

There is an alternative school of thought, almost exclusively based on Marxist ideas about commodity production in capitalist societies (Gore & Nicholson 1991). It holds that the production of buildings is merely a specialised form of commodity production and focuses on the ways in which capital flows into and out of different sectors of the economy. It contends that society's resources are distributed not by the market, but by the class struggle between capital and labour. Finance capital is constantly on the move in search for the highest rate of profit and will move into property development activity for only as long as

particular forms of development in particular locations offer the highest returns. (Harvey 1982 & 1985, quoted in Adams, 1994). Once this ceases to be the case, finance capital moves on elsewhere. The production of the built environment is therefore driven not by user demand but by the global search of finance capital for the highest investment returns. As a result, development activity is highly volatile with money flowing into favoured areas for short periods of time, while locations unattractive to finance capital remain permanently neglected. Gore & Nicholson note an overlap with the work of Ambrose noted above, the main difference being that the Marxist approach focuses exclusively on the flow of money or other forms of capital as the generating current of the system.

Given the less familiar nature of the Marxist approach a résumé is given in Appendix 2. Both of the Marxist models discussed, however, present only a "very blurred image of the development process" (Gore & Nicholson, p725) since they operate at a broad and abstract level. They create a theoretical background against which the movement of capital can be placed but 'barely penetrate into the detail of events of the development process and the nexus of relationships which might surround each" (Healey, 1991, p237). This, to some extent, is true of both types of structure conceptualisations. Adams (1994) notes that although they relate agency behaviour to the broader socio-economic framework in different ways, they are both too abstract to pinpoint the precise manner in which structure and agency interact. Like Allen (1997, see above), Healey and Barrett (1990, quoted in Adams, 1994, p67) maintain that the strategies, interests and actions of individuals and organisations are not automatically determined by such dominant social and economic forces. They contend that the structural framework for land and property development is

neither fixed nor free from challenge but rather that continuous interaction takes place between structure and agency. Although actors define and pursue their strategies, interests and actions in the context of a structural framework, structure itself is established, re-established or replaced as the resources, rules and ideas by which it is constituted are deployed, acknowledged, challenged and potentially transformed through agency behaviour (Adams, 1994, p 67).

Despite these issues both the structure and agency models provide different perspective on many aspects of the commercial development process and highlight the paucity of theoretical insights given by purely economic models. The Chapter comes back to these issues in its discussion of institutionalism below.

Healey and Barret (1990) and Healey (1991) suggest that one way to resolve such issues is to adopt a more holistic approach and bring structure and agency together in one model. They suggest that this is best done by connecting actor based or institutional forms of analysis with relevant perspectives from mainstream and Marxist economics and Healey (1992) produced a descriptive model using this approach (see later). Such ideas are wholly consistent with the systems view, in particular with a systems view of structure and structural change, even though the understanding of structure is slightly different in each case. It is also consistent with the evolutionary economics view of change and economic behaviour discussed in Chapter 3.

## INSTITUTIONAL MODELS

Ball (1998) reviews institutional approaches to modelling the property market and concludes that discussions of the place of the institutions is not about whether institutions matter in the behaviour of the property market but more about how their impact may be described and incorporated into models of the market. Ball's working definition of institutions is "the firms, public bodies and other agencies associated with property development". He identifies four main theories of institutions:

- Mainstream economics related (neo-institutional economics).
- Power approaches.
- Structure-Agency Institutionalism.
- Structure of building provision.

### Mainstream Economic Institutional Theories (neo-institutional economics)

Ball (1998) identifies four broad categories (although he notes that few of them have actually been applied to property markets).

- **Technical production characteristics**. Classic examples of this category would be studies of economies of scale. No studies of these characteristics have been undertaken for property development.
- **Transaction cost minimising**. This approach argues that institutions and their organisational structures evolve to minimise the transaction costs associated with production and exchange. Ball notes that this theory does provide a plausible hypothesis for a number of institutional structures in property development and

ownership. For example, it may be used to explain the existence of property companies in as much as individual investors would be faced with the fact that buildings are a lumpy investment, they are illiquid and it is difficult to spread risk across a range of properties. Investment in a property company that spreads the risk by holding a portfolio of properties reduces transaction costs for the investor and also gives them a liquid investment.

- **Game theory**. Game theory is concerned with investing strategic behaviour in the context of pre-defined situations and rules of behaviour (games). Ball notes the classic prisoner's dilemma where a lack of trust leads to less than ideal outcomes. This has not really been used in the context of property development.
- **Information theory**. Information theory describes the impact of individual or organisational knowledge of the market (or lack of knowledge) on behaviour and/or market structure. It encompasses situations where the differential assessment of risk (which is based on information on likely future performance or behaviour) actually influences or creates a structure. An example of this is the differential assessment of risk between users and property developers whereby the latter provide the building for the former to occupy (users are not prepared to take on the risk of construction). Signalling, where an individual or organisation indicates a characteristic in the market place through some understood form of behaviour, has also been placed in this category

This type of institutional analysis, which remains in the mainstream economics tradition, has been a growth area in economics but has not really been applied to the property world

(compare evolutionary economics). In their study of the economic organisation of cities, Lambooy & Moulaert (1996) recognise the same trend but use the term **neo-institutional economics** to cover this area. This is defined as (Lambooy & Moulaert, 1996, p217 after Eggertsson, 1990) *"economic theory in the tradition of neo-classical economics but relaxing its hypothesis of absence of institutional constraints on economic behaviour and of full information and costless exchange; therefore the consequences of positive transaction costs are examined*". It recognises some of the arguments outlined earlier in the debate current in the property industry, and attempts to accommodate some of them by relaxing the rigid economic view of mainstream (equilibrium) economics. In the neo-institutional city, however, transactions and transaction costs, property rights and contracts become the central notion. Exchange, co-operation and co-ordination happen through exchange of information and through transactions related to individuals and networks (Lambooy & Moulaert, 1996, p 228, see Appendix 3).

**Power Approaches**

Ball suggests that identifying institutional power and its consequences is the predominant approach to institutions within property research. In particular he suggests that it is concerned primarily with identifying power for its economic effects, to replace or supplement economics rather than to suggest an alternative. Within this category are included:

- General ad hoc insitutionalism.
- Conflict institutionalism.
- Behavioural institutionalism.

***General ad hoc insitutionalism.***

Studies within this category tend to put the emphasis on players rather than process. They are not really models of the market rather "elements are drawn together in ad hoc explanations" and "there is no clear theory of institutions" (Ball, 1998, p1506). They encompass market histories such as that due to Scott (1996). They provide useful information but, by the nature of their methodology, emphasise the actions of individuals over markets. The information contained in these studies has been drawn on in this work, particularly in the discussion of structural change in the market (see Chapter 3). They are also useful when analysing market interactions. They do not, however, in any sense, provide a model of the market/ commercial development process.

***Conflict institutionalism.***

Conflictual views of urban development processes inevitably have an institutional component in them because of the need to define the parties in conflict (Ball, 1998, p 1507). Ball goes on to note that with commercial property development the institutional focus is direct. On the one side in most conflict studies is the institution of the 'local community' and on the other, property developers. Planning authorities and other public bodies are the mediators of these conflicts. The theoretical stance of these models is generally radical or ad hoc, with a lack of emphasis on theoretical and other nicities in the relaying of ostensibly factual accounts (Ball, 1998, p1507). Furthermore, they identify the potential for social divisions over land use and the importance of major new property developments in altering the trajectory of a city's growth. In this sense, they represent both a frictional term/factor in the property market system and micro-diversity in the production

process (in terms of acceptability of development) with potential for structural change, albeit, probably, on a small scale (see change and the market, Chapter 3).

***Behavioural institutionalism.***

Behavioural institutionalism cuts across most of the sequential and agency models already discussed. It identifies particular types of agency (landowner, developer or financier) and suggests that they have behavioural characteristics that are distinct from those implied by rational profit-maximising calculation (Ball, 1998). This type of argument is at the heart of the property modelling debate noted above and is reflected in the recent work in neo-institutional and evolutionary economics referred to earlier. Ball appears to caution use of this approach and notes the difficulties that arise in quantifying the impact of any identified behaviour (because differences in preferences do not necessarily lead to distinct outcomes). He also notes the danger of treating behavioural differences as having permanent and major effects simply by virtue of their existence. Such difficulties, however, ought not to preclude an examination of the way in which behaviour can be incorporated in market models (to a greater extent than currently attempted by neo-institutional models). Indeed, part of the rationale of the systems approach is to recognise structural change and to examine ways in which such change can be rationalised and estimated.

Ball also notes the related problems of causality i.e. what should be attributed to the sub-group preferences and what to the context in which they operate. As indicated earlier, this agency behaviour approach needs structures in which the agencies can operate. A standard difficulty is then what is determined by structure and what by agency?

## Structure-Agency Institutionalism

Drawing on the work of Giddens (1984), Healey & Barrett (1990) suggest that it is necessary to explore how structure and agency relate to each other in land and property development in order to discover why development takes particular forms in particular places and at particular times (see above and Adams, 1994, p65). This has been carried forward by Healey (1992), who proposed a descriptive institutional model of the development process. A model was sought that "combined the understanding of structural forces within the tradition of urban political economy with an appreciation of the detail of the social relations surrounding the events in the development process" (Healey, 1992, p 36). The resulting work was not so much a model of the development process more a definition of the level of analysis models should address. Thus the work suggested four levels:

- A mapping exercise to describe the development process in operation focusing on events in the production process, identifying agencies involved and the outcomes produced.
- Analysis of the agencies involved in the process, identifying roles in the production and consumption/use of development and the power relations that evolve between them.
- The assessment of the strategies and interests of actors, particularly with respect to the most significant set of relationships within the process in order to identify what governed the way different roles were played and relationships developed. This

assessment may then be related to the resources, rules and ideas governing the development process in the instance examined.

- Relating the above analysis to the social relations of the society in which the development is being undertaken. This involves the '*theorisation*' of the nature of modes of production and regulation, of ideology and of the relations between them, and description of the particular *'societal'* circumstances.

Healey (1992) suggested that such a procedure was essential if researchers are to grasp more fully the varied forms of development activity, and thus "to challenge over-simplified generalisations about development activity. In particular, such research should enable the development of much richer hypotheses about spatial and temporal variations in property development activity".

It must be said that Ball appears to be less than enthusiastic about this approach. In his review (1998) he notes that the paper focuses attention on the agency part of the structure-agency dualism and takes issue that agency is not properly defined. Likewise he notes that no precise definition is given on what constitutes a structure or institution. Whilst this is true, to be fair, both structure and agency had been discussed at length in Healy & Barrett's 1990 paper. Although he discusses a variety of issues, what lies at the heart of the criticism appears to be the difficulty of resolving the issue of the duality/dualism of structure and agency and the ability of the model to accommodate change. In this context, Ball believes that rules are necessary to distinguish between structure and agency in order to identify causality and to explain change within its ambit. He also suggests that agencies have to

have some exogenous determinants of their existence to justify their separation from the structure "otherwise explanation of them merely collapses back into structural issues". It is not clear exactly what Ball means by this statement. He notes, however, that in the model's formulation it is conceptually hard to have social and economic (structural) explanations of agencies roles and existence. Conversely, in Ball's opinion, structural change cannot be greatly affected by agency behaviour. He notes that this problem of duality is extremely important when looking at institutions in a national or international comparative policy context because of the scale and the degree of the differences that have to be considered. He also seems to put great store by transaction cost minimisation in terms of the evolution of the development process. He notes that in this case there is no separate structure, but rather transaction economic forces imposing themselves on institutions causes them to adapt to new organisational forms over time. The systems analysis of change (discussed in Chapter 3) would take issue with this analysis of change. In particular, systems theory would suggest that *agents can and do affect change*. It will be shown that micro-diversity in the components of a system (including the actors in a system) can interact with the system environment to bring about structural change. The micro-diversity in behaviour is part of this process of change. It is also possible to relate structure and agency without any great definitive rules in a systems model if structure is understood as the key relationships which influence behaviour over time and not the external structure of a system which influences behaviour. Structure is combined with agency within the system boundary in this case. It is in such contexts that the systems approach can be unifying.

Ball is also worried that in the structure/agency approach institutions disappear as independent entities and what seems to be the practical focus of agency are the major players within each institution. There are two issues of import in this respect. In the first place, he notes that the strategy of the identified key agent in an institution has to be the institution's strategy as well. Conflicts may well exist within an institution and strategies may be in conflict with the institution's apparent objectives. This is probably less important than the second issue i.e. that outcomes might be attributed to strategies which are in reality the product of external or other forces. Proper analysis of the functions of institutions rather than the institutions themselves per se ought to be able to make distinctions in both of these cases and overall they ought not to detract from Healey's approach.

In summary, it is considered that, whilst there are some valid criticisms of the structure/agency approach it does represent an important philosophical step in the understanding of the commercial development process (and it represents a major influence on the systems approach taken in this work). There are some difficulties with the structure/agency analysis in terms of the definition of how the two aspects of market operation relate to each other. As Ball notes, there is a degree of duality at odds with the dualism of the approach. He attempts to resolve such issues through the structures of provision approach. This is outlined in the next section.

## Structures of Building Provision

The structures of provision approach was originally formulated as part of research on British housing (see for example Ball, 1986a). It was subsequently argued to be applicable to other forms of building and to the interpretation of issues such as urban rent and the

development of the construction industry (see Ball, 1985; 1986a; 1986b; 1998; Ball et al, 1998; Ball & Harloe, 1992). The approach is summarised in Ball, 1998 and Gore & Nicholson, 1991.

Ball defines a 'structure of building provision' as the "contemporary network of relationships associated with the provision of particular types of building at specific points in time" (Ball, 1998, p1513). He also notes that these relationships are embodied within the organisations associated with that type of building provision and they may take a market or non-market form. Provision encompasses the whole gamut of development, construction, ownership and use. He summarises the approach as follows:

- The network of organisations and markets involved in a particular form of building provision is the structure of that provision[5] therefore "there is no dichotomy between agency and structure".
- Organisations and markets are both part of the two-way influence on each other.
- Each type of building provision (houses, offices etc) is associated with historically specific institutional and other social relations and hence is a unique structure of provision. Also several might exist for a particular type of built structure at one point in time and he suggests, therefore, that there cannot be a universal explanation of the development process.
- Structures of provision are subject to continual change arising from factors like market pressures, changes in technology, tastes and policies and the strategies of the

[5] The interconnected social relations between the agents and institutions involved, the legal framework regulating such activity and the financial arrangements that allow it to proceed (Gore & Nicholson, 1991).

organisations involved. However, Ball notes (1998, p1514) that there is no *a priori* weighting of the importance of these potential influences and that structures of provision are only weakly evolutionary in nature. He suggests that there may be no contemporary rationale for the existence of a particular structure of organisations, institutions and markets – it just happens to be there (although it has a history and a future).

- It is a conceptual device for incorporating institutions into analyses of the development process. It does not constitute a complete theory in itself, rather it is a methodological theory.
- The relative importance of institutions is contingent and with it the significance of considering structures of provision. There will be many development issues where institutions do not matter.
- Defining what a structure of provision is has to be treated in an empirical way – which institutions and relations should be included and which distinctions are unimportant and can be ignored depend on the questions being asked and are a matter of researcher judgement.
- Within commercial property development in the UK the number of structures is limited to probably two that matter – the provision of speculative and non-speculative accommodation (although he suggests that the difference is relatively small).

Gore & Nicholson suggest that such structures are intrinsically dynamic and note the potential for change arising from the conflict and collaboration between agents leading to

the imposition of new legal controls or to the provision of new forms of finance etc. They also recognise the potential for change in the structure of provision as a result of external factors. However, the historically contingent nature of the approach has probably limited its use, since it is difficult to define them in an a priori manner (Ball, 1998).

Only two such structures of provision have ever been formally described. Both of these have been related to housing. For illustrative purposes that relating specifically to owner-occupied housing in Britain is shown in Figure 2.9.

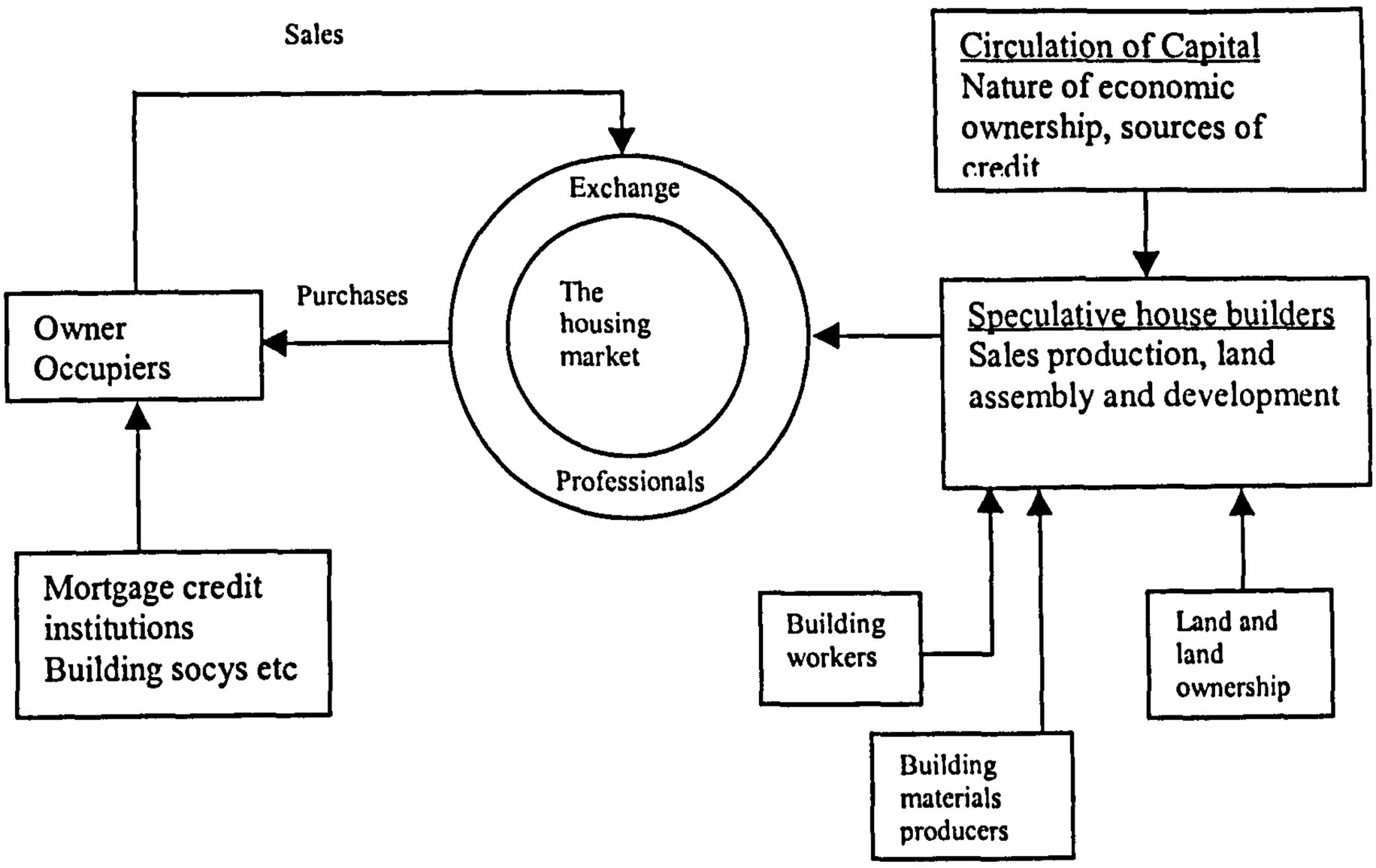


**Figure 2.9 The structure of owner-occupied housing provision (Ball 1986a).**

The underlying ideas of Ball's Structures of Provision approach are perhaps the closest of existing models to the systems approach. Thus the approach:

- Directly addresses the structure/agency issue. Ball reasons that since the network of organisations and markets involved in a particular form of building provision is the structure of that provision, there is no dichotomy between agency and structure.

- Begins to consider dynamic feedback (see Figure 2.9).
- Recognises and begins to address the question of change and the inability to adequately describe structures *a priori*.

Despite these philosophical insights the structure of provisions as represented and illustrated by Figure 2.9 is not that helpful. It only sketches the overall economic structure and its impact on the property market and shows links between agents and external factors without describing the dynamics. In addition, it is supply dominated. However, there are echoes of systems theory in the structures of provision approach and the analysis undertaken in the next Chapter will demonstrate that systems theory offers a formal methodology for developing the analysis undertaken by Ball.

## CLOSING REMARKS

The Chapter has reviewed a range of models of the commercial development process in the context of the current debate in property research concerning the extent to which institutional analysis of market behaviour should be integrated into economic models of behaviour. Reality reflects aspects of all of the approaches described and no one type of model can be said to be unifying. Mathematical/econometric models simplify the factors and interactive forces at work in pursuit of a reductionist mathematical description of behaviour whilst institutional and event sequence models describe the market and the associated commercial development process in qualitative terms and encompass a wide range of factors and behavioural forces. Ball's structure of provision approach seeks to identify different institutional, financial and legislative structures for different types of development. However, many of the so-called models are not models at all but sketches or

descriptions of actors and market behaviour whilst econometric/statistical models are limited in terms of their usefulness in analysing the underlying dynamic of market processes.

Guy & Henneberry (2000) critically reflect on the institutional approaches to the commercial development process in order to develop a research framework which blends economic and social analyses of the process. They argue for a perspective which views the economic and social as two interrelated aspects of a wider process of urban change in which structure and action are "recursively linked" (p2405). They recognise continuing problems of causality in terms of which outcome should be attributed to the actions of entities and which to the context within which they operate. However, they recognise that research should start to develop an analytical technique that is both qualitative and exploratory, and that is attentive to both structure and agency. They also suggest that this perspective [should] avoid models of development behaviour which presume the "character of human reasoning and rationality...[to be]...uniform...corresponding to a model of individual, rationalist self-interest" (from Shackley, 1996, p215 quoted in Guy & Henneberry, 2000, p2413). In contrast, the view of the property process should be "dynamic, deeply contextual and contingent both on the particular aims and objectives of development actors and on a shifting market framework which may enable or constrain development strategies". It also recognises the interrelationships between structure and agency and notes that such an approach "reconnects the social and the economic.....and allows us to explore how the property market[s] [is] constructed by competing design,

development and investment actors at local, national and global levels and over time" (p2413).

These kinds of distinctions can be seen in the analysis of 'neo-institutional and institutional cities' by Lambooy and Moulaert (1996, see Appendix 3) and the approach lies at the heart of this study, which suggests that systems theory offers a route to reconciliation. Implicit in many of the approaches described above is the concept of the property market as a system although the market and the associated commercial development process has never been formally conceptualised as such nor analysed in systems dynamics terms. The systems approach offers a formal methodology for unifying these themes and an alternative vehicle for examining the development process. Economic systems such as the property market are imbued by cultural values and underpinned by social and psychological customs that influence the way in which people understand their options and make their choices. The advantage of the systems approach is that it can address and integrate this diversity and offers a multi-dimensional framework in which information from different disciplines and domains can be integrated (Clayton & Radcliffe, 1996). It can incorporate actors, process and economic structures into one structure diagram and offers a way of reconciling the duality of structure and agency with the dualism implicit in that approach. Chapter 3 addresses and tackles these issues through its discussion of systems theory and Chapter 4 by proposing a market structure based on the approach.

## REFERENCES

Adams, D. (1994). *Urban planning and the development process.* UCL Press, London

Andersen, E.S. (1996). *Evolutionary Economics – Post Schumpeterian contributions.* Pinter, London.

Allen, P.M. (1997). *Cities and Regions as self-organising systems models of complexity.* Overseas Publishers Association, Amsterdam. Under license by Gordon and Breach Science Publishers.

Ambrose, P.(1986). *Whatever happened to planning*? Methuen. Andover, Hants.

Ball, M. (1985). The urban rent question. *Environment and Planning* A. 503-525.

Ball, M. (1986a). Housing research: time for a theoretical refocus? *Housing Studies.* **1, (3),** 147-165.

Ball, M. (1986b). The built environment and the urban question. *Society and Space*, **4,** 447-464.

Ball, M and Harloe, M. (1992). Rhetorical barriers to housing research:what provision is and is not. *Housing Studies*, 3-15.

Ball, M. (1998) Institutions in British property research: A review. *Urban Studies*, **35(9),** 1501-1517.

Ball,M., Lizieri,C and MacGregor, B.D. (1998). *The economics of commercial property markets*. Routledge, London and New York.

Barber, C. (1994). Forecasting the property market. *Estates Gazette*, **9443**, 52.

Barrett, S and Whiting A (1983). Reviewed in Gore, A. and Nicholson, D. (1991). Models of the land development process: A critical review. *Environment and Planning A*, **23(5),** 705-730.

Barrett, S., Stewart, M. and Underwood, J. (1978). The land market and development process: a review of research and policy. Occasional Paper 2, School of Advanced Urban Studies, University of Bristol.

Baumann, M.W. and Groth, J.C. (1996). Economic models: perspectives for the professional. *Journal of Property Finance*, **7(2),** 45-57.

Bryant, C.R., Russwurm, L.H. and McLellan, A.G. (1982*). The city's countryside: Land and its management in the rural-urban fringe.* Longman, Harlow, Essex.

Cadman, D. and Austin-Crowe, L. (1978). *Property development*. Spon, London.

Clayton, A.M.H. and Radcliffe, N.J. (1996). *Sustainability-A Systems Approach* Earthscan, London.

Cundell, I. and Harris, R. (1995). In what sense a forecast. *Estates Gazette*, **9501**, 32.

D'Arcy, E and Keogh, G. (1997). Towards a property market paradigm of urban change. *Environment and Planning A*, **29** 685 - 706.

Drewett, R. (1973). *The developers: decision processes*. In *The containment of urban England Vol II. The planning system; Objectives, operations, impacts*. Eds. P.Hall, H.Gracey, R.Drewett, R.Thomas. Allen & Unwin. London, 163-193.

Eggerston, Th. (1990). *Economic behaviour and institutions*. Cambridge University Press. Cambridge.

Forrester, J.W. (1969). *Industrial Dynamics*. MIT Press, Cambridge, Mass.

Fraser, W. (1993). *Principles of Property Investment and Pricing*. 2nd Edition. Macmillan.

Giddens, A.(1984). *The constitution of society*. Polity Press. London.

Goodchild, R. and Munton, R. (1986). *Development and the landowner: An analysis of the British experience*. Allen & Unwin, London.

Gore, A. and Nicholson, D. (1985*). Alternative frameworks for the analysis of public sector land ownership and development.* In *Land policy: problems and alternatives*. S. Barrett and P. Healy (eds) Gower, Aldershot, England. 179-202.

Gore, A. and Nicholson, D. (1991). Models of the land development process: A critical review. *Environment and Planning A*, **23(5)**, 705-730.

Guy, S. and Harris, R. (1997). Property in a global risk society: Towards marketing research in the office sector. *Urban Studies*, **34(1)**, 125-140.

Guy, S. and Henneberry, J. (2000). Understanding urban development processes: Integrating the economic and the social in property research. *Urban Studies*, **37(13)**, 2399-2416.

Harvey, D. (1982). *The limits of capital*. Oxford, Basil Blackwell.

Harvey, D. (1985). *The urbanisation of capital*. Oxford, Basil Blackwell

Harvey, J. (1996). *Urban Land Economics*. 4th Edition. Macmillan.

Healey, P. (1991). Models of the development process: A review. *Journal of Property Research*, 8 219-238

Healey, P. (1992). An institutional model of the development process. *Journal of Property Research*, 9, 33-44.

Healey, P. and Barrett, S.M. (1990). Structure and Agency in land and property development processes: some ideas for research. *Urban Studies*, **27**, 89-104.

Henneberry, J. (1995). Modelling inter-urban variations in the characteristics of the property development cycle. *Property Review*, **5(6)**, p183.

Kaiser, E.J. and Weiss, S.F. (1970). Public policy and the residential development process. *American Institute of Planners, Journal*, **36**, 30-37.

Keogh, G. and D'Arcy, E. (1994). Market maturity and property market behaviour: A European comparison of mature and emergent market. *Journal of Property Research*, **11**, pp215-235.

Keogh, G. (1994). Use and investment markets in British real estate. *Journal of Property Valuation and Investment*, **12(4)**, 58-72.

Key, T., McGregor, B., Nanthakumaran, N. and Zarkesh, F. (1994). *Understanding the property cycle: main report*, RICS, London.

Lambooy, J G. and Moulaert, F. (1996) The economic organisation of cities: An institutional perspective. *International Journal of Urban and Regional Research*. **20(2)**, 217-237.

Massey, D. and Catalano, A. (1978). *Capital and land: Land ownership by capital in Great Britain*. Edward Arnold, London.

McNamara, P.F. (1988). *Interests in land and planning in action. In Land use planning and the mediation of urban change*. P.Healey, P.F.McNamara, M.J.Elson,A.J.Doak (Eds). Cambridge University Press. Cambridge, 152-173.

Pindyck, R.S. and Rubinfield, D.L. (1998). *Econometric models and economic forecasts*. Irwin/McGraw-Hill. Boston, Mass.

Punter, J. (1985). *Aesthetic control within the development process: A case study*. Conference on Land Use Planning, Oxford Polytechnic.

Ratcliffe, J. (1978). *An introduction to urban land administration*. Estates Gazette, London.

Scott, P. (1996). *The Property Masters*. Spon. London.

Slater, J. (1996). *Accuracy of property performance forecasts*. Estates Gazette, 9615, p 98.

Shackley, S., Wynne, b and Waterton, C. (1996). *Imagine complexity: the past, present and future of complex thinking*. Futures, **28**, 201-255.

CHAPTER 3

# Addressing complexity and change: Systems theory and the property market

## INTRODUCTION

Despite the wide application of systems theory in other (related) areas and despite the implicit systems nature of much of the modelling outlined in Chapter 2, the systems approach has never really been used as a tool in property research. There have been some important studies relating to self organisation in cities and regions (for example see Allen, 1997 and Portugali, 1997) together with a little work on retail evolution (Evans et al, 1993) but none at the detailed level of property market process[1]. As a first step in addressing this deficiency, the Chapter reviews existing ideas and literature on systems theory, self-organisation and related work in evolutionary economics and it introduces some key ideas relating to systemic change and scenario building. The question of change is particularly important given the post-hoc nature of the modelling outlined in Chapter 2. The Chapter places the property market and the associated development process in the context of this work and begins to paint an alternative picture of market processes based on an open system approach. Finally, the Chapter gives a brief insight into quantitative aspects of

[1] Harris (1998) supports the view that the property market should be viewed as a complex system and there are strong elements of systems theory in the work of Roulac (1995, 1996a and b), but no formal analysis has been undertaken in systems terms.

systems theory and how modern simulation software might be used to undertake semi-quantitative modelling.

## GENERAL SYSTEMS THEORY

### Introduction

Systems theory (also termed systems thinking or the systems approach) is a conceptual framework for understanding complex systems. It forms part of a body of knowledge mainly developed over the last ten to twenty years but whose roots can be traced back to the work of Ludwig von Bertalanffy in the late 1940s and that of Alexander Bogdanov in the Soviet Union in the 1920s. This body of work encompasses general systems theory and the science of Tektology[2] (essentially the same ideas, see Trevillion, 2000), systems dynamics (and cybernetics from which it grew), evolutionary economics and ideas of self-organisation and theories of dissipative structures.

Although originating in the natural and physical sciences (Bertalanffy 1950a), the potential for using general systems theory in other branches of science, including social science, was recognised from a very early stage in its development (see Bertalanaffy, 1950b and 1951 and Biggart et al, 1998). Similarly cybernetics, with its ideas of information feedback and control, was developed as a general theory and embraced communications engineering, neurophysiology, psychology and sociology (Bertalanffy, 1951). In this context, Forrester

[2] Tektology was Bogdanov's term for the 'general science of organisation' (effectively general systems theory). There is strong evidence that Bogdanov was the first to examine systems theory in this non-biological sense but was not published in the west because the work was carried out during the time of Lenin in the early Soviet Union. The papers are still not readily available and the reader is referred to Biggart et al., 1998 for descriptions and analysis of his work.

is credited with first applying the ideas of control theory and feedback to business systems and coined the term "Industrial Dynamics" to describe the approach (see Forrester, 1961). He noted that "from the structure of a particular system arises its dynamic behaviour and the concepts of structure and dynamic behaviour apply to all systems that change through time. Such dynamic systems include the processes of engineering systems, biology, social systems, psychology, ecology, and all those where positive/negative feedback processes manifest themselves in growth and regulatory action". As a result of this wider applicability the term *systems dynamics* has gradually superseded the term *Industrial Dynamics*.

Forrester went on to define the structure of specialised computer simulation languages for systems analysis and much of the strength of systems dynamics comes from its ability to be used in simulation models for quantitative simulation. These can be used to support policy design as well as qualitatively to portray the workings of a system as an aid to thinking and understanding. The quantitative aspects of the approach are considered later (Chapter 4).

**The Nature of Systems**

Formally, a system may be considered as a set of components that interact with each other (Clayton & Radcliffe, 1996). This concept of a system is fairly straightforward and similar definitions had been used prior to von Bertalannfy's papers of 1950 and 1951 (see Bertalannfy, 1951). Likewise, the concept of a system was common in biology, physics, organisational science and cybernetics. Bertalannfy's contribution was to suggest the

universal nature of a systems theory[3] that would encompass all branches of science and the notion that there are principles which apply to entities called systems in general whatever the nature of their component elements and the relations or forces between them[4].

The underlying paradigm is holistic and suggests that the behaviour of complex systems can only be understood by contemplating the whole system and not individual parts in isolation. In this context, the approach involves placing as much emphasis on identifying and describing the connections between objects and events (components) as identifying and describing the objects and events themselves (Clayton & Radcliffe, 1996). These connections can be quite complex. Changes in one component can induce changes in another, which in turn can induce changes in a third component. This chain of cause and effect can eventually loop back on itself in a so-called feedback loop. A feedback loop is called positive when the input back to the initiating component is excitatory (i.e. makes that component more likely to initiate a further similar event sequence). It is called negative when the input back to the initiating component is inhibitory (i.e. makes that component less likely to initiate a further similar event sequence – see Clayton & Radcliffe, 1996, p18 and Appendix 4).

---

[3] He notes that General Systems Theory allows logico-mathematical definitions of many ill defined and much disputed concepts such as those of wholeness, summativity, emergent and resultant evolution, progressive segregation, mechanisation and centralisation, hierarchical order, controlling parts, trigger action, competition, finality and equifinality, physical and biological time etc. Some of these aspects will become clearer later in the Chapter.

[4] In this sense Bertalannfy considered that systems theory was *a priori* and independent of its interpretation in terms of empirical phenomena. It was applicable to all empirical realms concerned with systems and could be compared to say probability theory, which was a mathematical doctrine applicable to different fields.

These ideas of positive and negative feedback were first identified in cybernetics and are basic parts of control theory. They were incorporated into system dynamics and now form a central part of systems theory. Based on this view of systems operation:

- Systems are seen as feedback processes having orderly structures (in the sense of key relationships that influence behaviour over time) from which arise their dynamic behaviour (Forrester, 1969)[5].
- Systems theory holds that in order to understand how a system reacts to dynamic external forces (from its environment) it is necessary to understand the dynamic relationships in the system structure. The structure of the system will define the reaction of the system to exogenous influences - the system's performance is not just driven by external forces, the system itself bears a responsibility for the performance it exhibits.
- The approach presents the positive and negative feedback loops which influence/control behaviour in the form of a systems structure diagram.

This concept of structure as a group of feedback loops incorporating actors, events and other components is substantially different to that described in structure and agency models of the market being less deterministic and incorporating agents and their role in the property market process.

[5] It is possible for a system to contain more than one feedback loop.

Coyle (1996) has taken a more pragmatic view of the system and to some extent more orientated to the industrial dynamics approach noted earlier. He defines a system as "a collection of parts organised for a purpose". This emphasises the idea that the parts are organised in order to achieve or contribute to a purpose e.g. in the case of business management, the survival and prosperity of the firm. This does not necessarily mean that the system is simply a construct set up for a specific purpose, although it can be, rather it highlights the idea that the system may fail to achieve its purpose:

- Due to poor connections.
- Because it is knocked off course by an external shock.
- Because the purpose is incapable of being achieved.
- Because it attempts to adjust to change even to the extent of making matters worse.

The system is there for a reason would be a better interpretation e.g. the property market is there to buy and sell property. This leads to the rather restricted view that systems dynamics is a branch of management science that deals with the dynamics and controllability of managed systems. Coyle does note, however, that managed systems are not always business firms. The idea of a managed system has been related to the system dynamics of the growth and collapse of civilisations, the behaviour of national social and economic systems and the decline in cities.

## Defining Characteristics

An important first philosophical step in the systems approach is to accept the endeavour under study as a system. This acceptance may be actual or conceptual. However, both

Steiss (1974) and Clayton & Radcliffe (1996) suggest that for such conceptual models to be valid it is important that they capture the essential system structure and that the structure reflects the elements, interconnections and feedback loops present in reality. Steiss calls this connectedness and notes that without this connectedness there would be little point in identifying the selected interaction of elements as a system.

Steiss (1974) examined this question in some detail in his study of urban systems dynamics. He defined a system as "an entity, physical or conceptual (real or cognitive), that is composed of interrelated parts". This distinction is quite important. In the case of urban systems he notes that whilst it may be common sense to accept that urban phenomena can be organised and analysed as systems it is possible that such phenomena lack the properties associated *intuitively* with anything that could be reasonably called a system. It could be that a set of interactions constitute a system if, and only if, they naturally cohere, i.e. that systems are given in nature. It is also possible to assume that all systems are constructs of the mind and as a result it is pointless to try to distinguish so-called natural from "non-natural" systems. Ultimately, Steiss comes to tha conclusion that a set of variables that show some degree of interdependence and seem to have a common fate may be said to constitute "an interesting and useful system *from the point of view of understanding* the operations of an urban system". In this context he thought it important that the connected parts exhibit properties which included:

- The ability to operate on a series of inputs to produce outputs.

- Goal directedness (a relationship to the basic functions for which the subsystem was established to serve[6]).

Clayton and Radcliffe identify a further three important defining characteristics of systems:

- **Emergence,** which recognises that systems, by definition, have behavioural or other emergent properties that the components of the system do not and which are not readily explicable with reference to the sub-components. Systems are dynamic and structures can adapt and change in response to their environment. An important feature of this change is system stability, which can be an emergent property, *a function of individual elements in the system*[7].
- **Hierarchical control**. Hierarchies are levels of relative complexity within a system and hierarchical control refers to the imposition of new functional relationships by each level on the detailed dynamics of the level below (Clayton and Radcliffe, 1996, p18).
- **Communication,** which refers to the transmission of information in some form to effect regulation and feedback. Information must flow from the regulator to the regulated in order for the regulator to exercise control. Information must also flow back from the regulated to the regulator if the latter is to be able to monitor compliance of the regulated and incorporate that information into its future

[6] He notes that this should involve a monitoring of performance through some sort of feedback mechanism.

[7] Note in particular with respect to the structure/ agency duality/dualism issue in the last Chapter and the ability of agents to affect evolution.

programme (see Appendix 4). Positive and negative feedback loops are at the core of this process. If the regulated has failed to produce an adequate response to the last signal, the regulator must send a similar signal. If the regulated has produced an excessive response the regulator may have to send a converse[8].

**The System and its Environment: Open and Closed Systems**

Bertalannfy not only promoted the notion of general systems theory but also developed the concept that most real world systems are, or may be viewed as, open (Hitchin, 1993). Again the notion of open and closed systems was borrowed from the natural sciences with a view to applying it on a much wider basis. In the physical world, open systems are systems where there is inflow and outflow and therefore change of the component materials. A system is termed closed if no material enters or leaves it (Bertalannfy, 1951).

An important related concept is that of entropy, which Bertalannfy borrowed from classical thermodynamics. In the physical world, the second law of thermodynamics holds that without the input of energy all systems tend to move from organised to disorganised states. Entropy is a measure of this disorder. Thus the entropy of any system that is not receiving any energy input will, with overwhelming probability, increase over time. This is true in closed systems, which have unchanging components and will eventually arrive at a state of equilibrium and towards a state of higher entropy as a result of the conversion of energy to

[8] These authors also note that the extension of systems theory to social and economic systems has required an evolution of the concept of communication as it is the communication of meaning rather than the communication of information that is important in the world of human systems.

entropy[9]. Importantly, however, open systems can reach a steady state that depends on them being able to maintain continuous exchanges with their environment. These exchanges can consist of materials, energy or, in the case of social and economic systems, information and people. This is what allows some open systems to create and maintain a state of low entropy (order) and maintain their integrity as systems (Clayton and Radcliffe, 1996, p20). Hitchin (1993) calls this *configuration entropy*, which relates the way in which things are organised in relation to each other. It is the degree of disorder in pattern, organisation and structure and allows the ideas of general systems theory to be used in non-tangible systems such as those found in economics and the social sciences. Only transfer (of some kind) across a boundary in an open system can reduce configuration entropy and create and maintain complex structures (order) on a continuous cycle. On this basis Hitchin defines a system as "a collection of interrelated entities such that both the collection and the interrelationships together reduce local entropy". The definition embraces both tangible and perceived systems.

In a similar vein, Bertalannfy noted that in the evolution of open systems, entropy may decrease because there is not only production of entropy due to irreversible processes but also transport of entropy, negative or positive, through the introduction of material from the outside. Therefore such systems may spontaneously develop towards greater heterogeneity and complexity (Bertalannfy, 1952, p310). Any view of a system as closed, therefore, is evidently limited (see also economics and closed systems later). Although scientists seek to investigate phenomena under closed (controlled, reductionist) conditions, measuring

[9] Since there can be no transfer of energy across the system boundary in a closed system.

separately the impact of one independent variable on another dependent variable to the exclusion of others, they are aware that such conditions are an approximation at best. Reductionism is "the icon of the closed system approach" (Hitchin, p623). In the real world, systems are *de facto* open.

In conceptual systems a major difficulty is where to set the system boundary. This boundary defines the limits of the interactive system. It does not close the system since in open systems the system interacts with the environment across the system boundary[10]. However, the system's intrinsic growth and stability characteristics are defined by the connections within the boundary. The system is in constant dialogue with its environment but the structure of the system within the (defined) boundary will determine the reaction of the system to exogenous shocks or influences.

## COMPLEX ADAPTIVE SYSTEMS

### Complex Systems

Systems models in general describe the connected behaviour of components/sub-systems. If these are few, and each sub-system/component has a fixed internal structure, then a systems model can be a complete representation of the behaviour of the connected parts. A complex

[10] Hitchin notes that in the real world there are likely to be a set of interacting systems and defines the system environment in these terms thus: "environment is that which mediates the interchanges between systems".

system, however, is one where there are so many sub-systems/components connected together that some reduced, aggregate description is necessary (Allen, 1997, p9)[11].

It is possible to produce structure diagrams for such systems, albeit with some reduced descriptions for the components, together with some systems dynamics equations to describe the mutual interactions of the actors present in the system. Such descriptions, however, are only good for the short term (until the structure changes) and are generally post hoc. Systems dynamics does not explain why the structure is there and how it might adapt. In addition, it has no way of producing new types of objects, new variables and the predictions generated will only be true until some moment, unpredictable within the model, where there is an adaptation or innovation and new behaviour emerges (see Allen, 1997, p5). This is a common fault of the property market models described in Chapter 2 and indeed of the systems structure diagram outlined Chapter 4. System dynamics might provide a greater insight into the workings of the system but underneath the description is the "richer, more difficult, microscopic reality of diversity and individual subjectivity which, in fact, provides for the adaptive responses of the system and its creativity" (Allen (1997, p xiv). In the context of the property market, market structures will change and these changes will inevitably impact on the description of the market and any predictions that arise there-from. Importantly however, the concept of open, complex adaptive systems offers a way of analysing this change.

---

[11]Clayton & Radcliffe (1996) note that in this sense some element of reductionism may be necessary despite the holistic approach. The important point is, however, that the approach attempts an 'intelligent and sophisticated reductionism' which embraces contributions from different disciplines (p17).

## Evolution and Adaption

Recent work on evolutionary and self-organising systems, as well as modern studies on evolutionary economics, largely ignored in property research, is beginning to address the issue of change in systems and the modelling of change.

Generally speaking, complex systems evolve from simpler systems rather than arriving in a fully formed state (Clayton & Radcliffe, p34) and complexity will normally develop only if it confers a net adaptive advantage to the parent system. Part of this advantage may result from the complexity making the system more robust and a key consideration for an adaptive system is stability. Despite being able to sustain a certain degree of stress as a result of the complex structure, however, complex systems almost invariably have thresholds. Once such systems are pushed beyond critical thresholds (for example when vital negative feedback loops are broken) they typically undergo some sort of transition into a new state. Importantly, the speed of transition will depend on the nature of the system and on the precise circumstances of change, as will the relative stability of the new state compared to the one that obtained earlier.

As regards the actual mechanism of change, there is now significant support for the view that systems adapt and change as a result of either self-organisation or evolution (see Allen, 1997; Foster, 1997; Portugali, 1997). Evolution is a special case of the more general phenomenon of adaption (Clayton & Radcliffe, 1996, p30).

### *Self organization*

Self-organisation is the adaptive response of a system to changing external conditions. For complex systems made up of components with fixed internal structure, their interactions can lead to self-organisation. The concept is founded upon an observable historical process captured in the entropy law (Foster, 1997) and deals with **non-equilibrium structural change**. It appeared as a concept in the early years of cybernetics (as early as 1943) and is related to several theories developed since the mid-1960s (Portugali, 1997). In this sense it is a general umbrella for several theoretical approaches that differ in their treatment of such systems and the emphasis that they give to the various processes. These include theories of synergetics, dissipative structures, catalytic networks and ultimately chaos theories. The ideas of dissipative structures are amongst the most influential in the domain of cities and urbanism (Portugali, 1997) and this brief review will concentrate in this area.

Allen's work on dissipative cities (1997) reflects this approach, which was discovered and investigated by the so-called Brussels school (original papers published by Nicolis & Prigogine - see Portugali, 1997, p357 and Allen, 1997, p9). Allen defines self-organising systems as collective structures that emerge from the interplay between average behaviour and deviation around this which drive the system through successive instabilities. While its structure is stable, the system may be described by the 'churning' of its connected parts. However, when instability occurs the system can change its structure spontaneously and afterwards it will be described by the 'churning' of a new set of parts. The system is therefore both the structure that is observed at some aggregate level and the deviation around this, which can change the structure. This micro-diversity provides the basis for the

adaptive responses of the system and its creativity. It is the interaction between micro-diversity and external fluctuations or events, which bring about change in the structure. Self-organisation therefore involves both the external conditions being applied to the system and also the detailed events that have occurred within it - its history. Such change is dependent upon systems being open and being able to reduce configuration entropy by interacting with the system environment. Portugali (1997, p368) notes in this context that self-organising systems are chaotic for short periods of time. Like open systems in general, the evolution of self-organised cities exhibits a very distinct and routine path: a long period of steady state followed by a short period of strong fluctuations or chaos from which the system re-emerges to a new level of steady state and structural stability. Every evolutionary move is a transition from a microscopic chaotic state to an ordered, macro, steady state.

Early interest in self-organisation was related to the finding that in certain situations external forces acting on a system may not determine/cause its behaviour, but instead trigger an internal and independent process by which the system spontaneously self-organises itself. Subsequent studies by Haken and Prigogine (see Portugali for the extensive bibliography relating to this work) were interested in a more complex process illustrated by the so-called B rnard experiment (Portugali, p358). In this experiment B rnard found that when heating a liquid from below, initially (when the temperature difference between the heated bottom and the cool top is low) heat is transferred by conduction and no macro-motion is observed. As the temperature difference increases and a certain threshold is reached the movement of the liquid becomes unstable, chaotic and then a remarkably ordered pattern appears. The molecules of the liquid suddenly exhibit a coherent macro-

movement in rolls, which are a million times larger than the molecules. If the liquid is contained in a round vessel the motion actually forms an hexagonal pattern on the surface of the liquid – an outcome of the movement of the hot liquid which rises through the centre of the honeycomb cells and of the cooler liquid which falls along their walls. This spatial order appears spontaneously as a result of self-organisation.

Such structures have been termed *dissipative*. They only arise because of the open nature of the system and the ability to reduce entropy (see above). Heat transfer (considered a source of waste in classical thermodynamics) across the system boundary in B rnard's experiment actually brings about order. Portugali notes that this close association between structure and order on the one side and dissipation or waste on the other has led to the term dissipative structures being used in such situations.

***Evolution***

The term evolution specifically relates to the evolutionary response on the part of the system's components. If the micro-components of a system have internal structure, and if, in addition, this can change through time (thus changing the behaviour of the individual elements) then evolution can take place as the emergent macro-structure affects the local circumstances experienced by individuals. This can lead in turn to a structured adaptive response, which in turn changes the macro-structure generated.

**System Futures**

The key idea of open systems subject to exchanges of energy and matter with their environment and with non-linear interactions between the micro-elements, can give rise to

macroscopic states of organisation and behaviour that undergo bifurcation producing new states of organisation (see Figure 3.1 and Allen, 1997, p18).

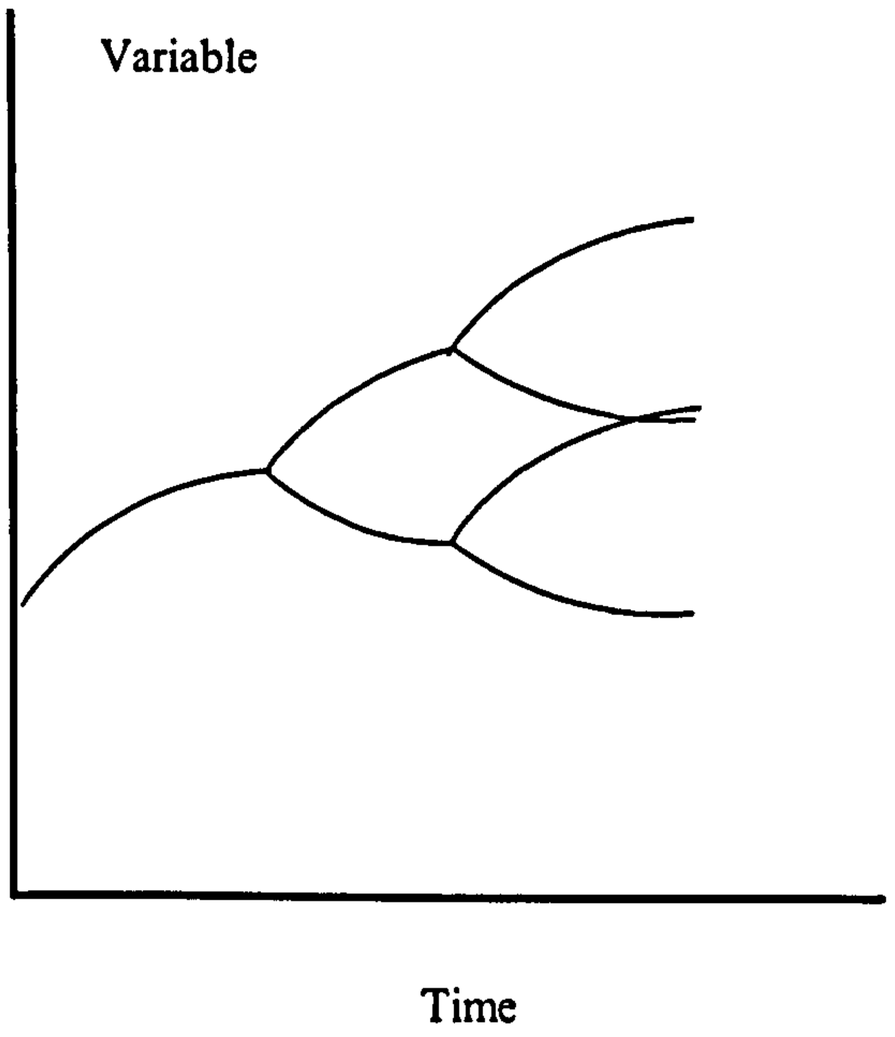


**Figure 3.1. A bifurcation tree of possible solutions to the dynamic equations (after Allen, 1997)**

For identical external conditions various possible structures (or futures) can exist. On any possible branch of its future history the trajectory of behaviour is fairly stable and its response to external change may be deterministic. When the system is nearing a branch or bifurcation point, however, it becomes relatively unstable and small disturbances can be decisive in nudging it into one branch or another (see Allen, 1997 p18). Allen suggests, however, that the one that predominates is a mixture of chance and necessity.

This property of complex adaptive systems gives some philosophical basis to the exercises in scenario building, which are becoming popular in a number of disciplines (see for example RICS 2001 for recent scenario analyses for the property market). They are a

recognition of change and the inability of equilibrium models to deal adequately with it. For comparisons to have some collective legitimacy, however, decisions "must take into account the different voices of the system" (Allen, 1997, p19). It is in this context that an examination of micro-diversity in property market factors/components and their interaction with the environment is important and should form the basis of future work in this field.

## ECONOMIC SYSTEMS

Given the developments associated with the concept of complex adaptive systems outlined above, it is not surprising that Clayton & Radcliffe (1996) suggest that one of the most important challenges to any economic theory is to explain the process of economic change and growth. Fifty years ago Joseph Schumpeter had intuitively recognised the importance of change and the inability of mainstream economics to address it[12] (see Foster, 1997, p 429). Despite Schumpeter's intuition his ideas have largely been ignored by mainstream economics. However, general systems theory has precipitated a number of evolutionary approaches to structural change, particularly over the last decade (Foster, 1997). This concern with the ability to understand change can also be detected in property research and is partly at the core of the property debate noted in Chapter 2.

[12]Schumpeter offered no way of representing what he saw as non-equilibrium processes of endogenous structural change. This debate continues particularly with respect to the ability of mainstream economics to address change in the economic world. The debate is bigger than the property debate outlined earlier!

## Evolutionary Economics

The approaches to change in economic systems have been grouped into three main areas (Foster, 1997; Clayton & Radcliffe, 1996) most of which have already been described in one form or another either in this Chapter or Chapter 2. They are:

- A main stream (neo-classical) economics approach that highlights the competitive aspects of economic evolution using formal game theories, genetic algorithms and artificial life simulations (Foster, 1997). As noted, such models of change tend to focus on the forces that move the economy towards equilibrium and are not, in general, concerned with the details of the process through which technological innovation occurs.
- Institutional economics, discussed briefly in Chapter 2.
- Evolutionary theories of economic growth concerned with the details of the process through which technological innovation occurs and with the forces that upset equilibrium as much as with the forces that move the economy towards equilibrium.

The second and third groups overlap in a common belief in the importance of institutional structures (Clayton & Radcliffe, 1996, p147). The third group, evolutionary economics, with its roots in the school of institutional economics invokes general principles concerning systems to make inferences about interactions in the domain of economics. From this evolutionary viewpoint, large-scale features of economics emerge from the detailed interactions of individual firms and sectors of industry. They use ideas of both self-organisation and evolution.

Andersen (1996, p15) identifies six typical assumptions and characteristics of evolutionary economic explanations which are particularly germane to the property debate:

- The agents (individuals and organisations) can never be perfectly informed and they have (at best) to optimise locally rather than globally.
- The decision making of agents is normally bound to rules, norms and institutions.
- Agents are to some extent able to imitate the rules of other agents, to learn themselves and to create novelty.
- The process of imitation and innovation are characterised by significant degrees of cumulativeness and path dependency but they may be interrupted by occasional discontinuities.
- The interactions between the agents are typically made in dis-equilibrium situations and the result is successes and failures of commodity variants and method variants as well as of agents.
- The processes of change occurring in a context described by the above assumptions and characteristics are non-deterministic, open ended and **irreversible.**

Once again the approach contradicts mainstream economics. Andersen notes that neo-classical economic explanations of behaviour have traditionally not only ignored evolutionary processes but also excluded them from the analysis because of the assumption of fully informed decision making with infinite powers of computation. Such an approach

puts an emphasis on the validity of the outcome of the economic process rather than examining mechanism per se[13].

Evolutionary approaches draw heavily on biological analogies. Clayton & Radcliffe (1996) note that there are a number of ways that biological systems appear to have certain formal analogies with economic systems. These include ideas of organisational knowledge (the shared knowledge, learning and culture of an organisation) and its effect on the structural and behavioural stability of a firm. The ideas sit comfortably within general systems theory although Foster (1997) cautions against going too far down the biological evolutionary analogy. He argues that self-organisation is a better analytical framework since it can capture structural change not through the use of analogy but as an irreversible and uncertain process that operates in different ways at all levels of complexity (see Foster, 1997, p430). Furthermore, it examines economic evolution in its own unique social, political and psychological framework.

In this context, Georgescu-Roegen (1971, 1976 quoted in Foster, 1997 p438) supported the notion of open economic systems that obeyed the entropy law (interestingly, before the ideas on self-organisation were fully developed). He pointed out that the problem with neo-classical economics is that it is constructed as if the first law of thermodynamics (the conservation of energy) for closed systems obtained yet it also contended that economic

[13] Andersen, however, points out the fundamental problem with the evolutionary approach, which equally applies to the adaptive systems approach, viz. that subjective values and constraints of the economic agents cannot be dealt with empirically in a fully satisfactory manner.

systems are open. Like Bertalannfy, Allen and others, he argued that this openness means that economic systems must be understood in terms of the second law (the entropy law) which was viewed as being the "very foundation of economics". Time irreversibility was viewed as being central to the operation of the entropy law in these systems as well as physical and natural systems (irreversibility is closely associated with the second law and based on the general irreversibility of processes without a massive input of energy). In the case of economic systems, economic structures are created with low entropy characteristics (configuration entropy) and are used in an economising manner through time and they are scrapped when opportunity costs become too high. Economic self-organisation, in particular, involves the deliberate acquisition of knowledge which is applied to create increases in economic organisation and complexity (Foster, 1997). Limits to growth arise because of time irreversibility in specialised economic structures resulting in non-linear structural discontinuities and fundamental uncertainty (Foster, 1997, p449). An advantage of the self-organising approach is that it encompasses time irreversibility, structural change and fundamental uncertainty in an analytical framework that can be used in empirical settings (Foster, 1997, p449).

Evolutionary economic theory, based on general systems theory, does not assume, as mainstream economic theory does, that what firms do is optimal. It assumes the "firms will, in general, try to survive and make profits, but their decisions are not necessarily rational, value free or made on the basis of perfect information" (Clayton & Radcliffe, 1996, p149). It also assumes that firms will adapt as their competitive environment changes. Allen (1997) contrasts this accommodation of individual goals and preferences and their diversity

with the equilibrium approach, which supposes that the collection of individuals within the system somehow makes decisions in such a way as to drive the system to equilibrium i.e. to some changing condition which expresses some collective. In reality, however, "economies do not appear to exist in static equilibrium. They change both quantitatively and qualitatively, they fluctuate, expand and collapse" (Clayton & Radcliffe, 1996, p150). As noted in Chapter 2, the vision of equilibrium with individuals and organisations having clear responses to events that are perceived with absolute clarity is not one that normal people would recognise as corresponding to reality. This type of behaviour is more readily understood in terms of complex adaptive systems.

In support of the approach, Clayton & Radcliffe note that economies demonstrate at least some of the defining characteristics described earlier. These include emergence as well as positive and negative feedback loops. They note that negative feedback loops that serve to maintain balances between supply and demand are well understood and can be accommodated within the mainstream economics view[14]. More to the point these authors note that there also appear to be positive feedback loops that can generate increasing returns and which can be less well accommodated within the mainstream economics view[15].

[14] The property market systems structure diagram discussed later incorporates such a loop.

[15] Such a loop is the archetypal 'success to the successful' loop (see Senge, 1990, p385) which explains the success of products such as the VHS video system and the QWERTY keyboard over more effective alternatives. Here, an imperceptible initial advantage can lead to market domination.

## SIMULATION

Much of the strength of systems dynamics comes from its ability to be used in simulation models for quantitative simulation to support policy design as well as qualitatively to portray the workings of a system as an aid to thinking and understanding (see Coyle, 1996 pi). Simulation in this context should not be interpreted necessarily as predictive modelling. Rather it allows an analysis of the overall behaviour of the system for comparative purposes as an aid for understanding and policy considerations.

Structure diagrams such as that produced in Chapter 4, like all systems diagrams are, per se, extremely useful qualitative tools. They define the elements of interest and, more importantly, the relationships and feedback loops between them. In systems dynamics simulation, however, the system is represented in terms of equations that describe the relationships between elements. A set of equations are created to represent the system and are run forward in simulated time in an attempt to mirror the behaviour of the system as it runs forward in real time. The key to quantitative simulation is that the equations must do the same things the real system would have done, *and for the same reasons*, if the model is to be regarded as satisfactory. It is not simply the intention to represent reality by juggling variables to get a statistical fit to historical data. The equations for key relationships must bear some relationship to perceived responses or behaviour. To achieve this, two types of variable are used:

- Those representing the state of the system at any point in time. In control engineering these are termed state variables. In systems dynamics they are termed levels or *stocks*.
- Those representing the physical flows in the system that arise as a result of actions and produce consequences in the information/action/consequences sequence. They are termed *flows* or rates.

The simulation also requires auxiliary variables to be able to perform other functions eg to convert units of stocks and flows. These are termed converters. All of these basic building blocks are summarised in Appendix 5.

**Simulation software**

It is possible to write (with some effort) systems dynamics models using spreadsheet packages or general-purpose languages such as *Fortran.* There are, however, several commercially available software packages designed specifically for modelling. Coyle (1996) gives a thorough review both of the packages available and their historical development, and the reader is referred to this work for more information. The package used in Appendix 7 (later) is the *ithink* package developed in 1990 and modified in a number of versions since. This is based on Forrester's flow diagrams and is designed to be able to construct systems dynamics models on screen by piecing together symbolic icons.

## CLOSING REMARKS

The Chapter has introduced and developed a number of key ideas which are of relevance to the treatment of the property market in the next Chapter and which potentially offer a

methodology for reconciling some of the modelling issues highlighted in Chapter 2. Such issues relate particularly to the interaction of structure and agency. The Chapter has in particular introduced the concept of complex systems and the underlying paradigm that such systems can only be understood by contemplating the whole system rather than individual parts in isolation. This point of view is important and distinguishes the approach from many reductionist views of the property market. The concept of structure as the key relationships that influence behaviour over time and which can incorporate actors events and other factors is also fundamental, being less deterministic than that of structure in structure/agency models of the property market.

Another important concept is that of the open system that allows exchange across the system boundary with the system environment. This concept, together with that of configuration entropy ultimately provides a methodology for understanding change based on ideas of complex adaptive systems and non equilibrium structural change. It reflects a real world-view and forms a philosophical basis for scenario building based on a number of possible futures. The understanding of this type of structural change is crucial if we are to predict future behaviour in the property market. Changes in market structures will inevitably impact on the description of the market and any predictions that arise therefrom. In order to model change we must try to understand and model the evolutionary tree of successive structures (Allen, 1997).

In tackling and describing these issues the work has drawn on a body of knowledge largely ignored in property research and has refined it for the purposes of understanding property

market behaviour. In doing so it highlights the need to place property research on a par with cutting edge studies in modern evolutionary economics and with studies of self-organising systems. Studies of the property market have not got beyond first base in conceptualising the market and the development process as a system with systemic qualities let alone considering how it evolves and adapts to its environment and how this evolution may be described. It is in danger of being left behind by these related disciplines, which are moving beyond an analysis simply based on equilibrium economics. In this context, systems simulation has also been discussed.

In the case of the property system it is not possible to even begin to understand change until some definition of the system itself and its components is made. The analysis in the next Chapter is undertaken with this in mind before attempting to put the system in the context of historical change.

## REFERENCES

Allen, P.M. (1997). *Cities and regions as self-organising systems: Models of complexity.* Gordon and Breach.

Andersen, E.S. (1996). *Evolutionary Economics – Post Schumpeterian contributions.* Pinter, London.

Bertalanffy, L. von. (1950a). The theory of open systems in physics and biology. *Science*, **III**, 23-29.

Bertalanffy, L. von. (1950b). An outline of general systems theory. *Brit. J. Philos. Sci.*, **1**, 134-165.

Bertalanffy, L. von. (1951). Problems of general systems theory: A new approach to the unity of science. *Human Biology*, **23(4)**, 302-312.

Biggart, J., Dudley, P. and King, F. (1998). Eds. *Alexander Bogdanov and the origins of systems thinking in Russia.* Ashgate, Aldershot, Brookfield (USA), Singapore, Sydney.

Clayton, A.M.H. and Radcliffe, N.J. (1996). *Sustainability-A Systems Approach* Earthscan, London.

Coyle, R.G. (1996). *System dynamics modelling: A practical approach*. Chapman and Hall, London.

Evans, K.R., Barnes, J.W. and Schlacter, J.L. (1993). A general systems approach to retail evolution: An existing institutional perspective. *International Review of Retail, Distribution and Consumer Research*, **3(1)**, 79-100

Forrester, J.W. (1961). *Industrial Dynamics*. MIT Press, Cambridge, Mass.

Forrester, J.W. (1969). *Urban Dynamics*. MIT Press, Cambridge, Mass.

Foster, J. (1997). The analytical foundations of evolutionary economics: From biological analogy to economic self-organisation. *Structural Change and Economic Dynamics*, **8**, 427-451.

Georgescu-Roegen, N. (1971). *The entropy law and the economic process*. Harvard University Press. Cambridge, Mass.

Georgescu-Roegen, N. (1976*)*. *Energy and economic myths: Institutional and analytical economic essays*. Pergammon, New York.

Harris, R. (1998). Predicting what's happened and explaining what hasn't: towards a synthesis in property research. *Property Research Digest (Society of Property Researchers)*, February, 36-41.

Hitchin, D. K. (1993). A unified systems hypothesis. *Systems Practice*, **6(6)**, 613-645.

Portugali, J. (1997). *Self-organising cities*. Futures, **29(4/5)**, 353-380.

RICS (2001). *2020: Visions for the future – Summary*. Ian Cooper. RICS Research Foundation.

Roulac, S.E. (1995). Strategic decision models: Multiple perceptions, unifying structure. *Journal of Real Estate Research*, **10(5)**, 495-508.

Roulac, S.E. (1996a). Real estate market cycles: Transformation forces and structural change. *Journal of Real Estate Portfolio Management*, **2(1)**, 1-17.

Roulac, S.E. (1996b). The strategic real estate framework: Processes, linkages, decisions. *Journal of Real Estate Research*, **12(3)**, 323-346.

Steiss, A.W. (1974). *Urban Systems Dynamics*. D.C.Heath, p279

Trevillion, E.A. (2000). Review *Alexander Bogdanov and the origins of systems thinking in Russia*. Capital and Class, **71**

CHAPTER 4

# The Commercial Property System

## INTRODUCTION

Development concerns the emergence of new spatial organisation, new activities and behaviours and the structures that these lead to (Allen, 1997). It operates on a number of levels. At the macro level it concerns the changing structure of cities, regions and nations and the process of urbanisation. This spatial development process, however, operates through the provision process which itself is one part of the decision process and is impacted on by other factors in the urban system (existing spatial distribution, transport infrastructure, the local economic situation as well as macro economics).

The concepts of self-organisation, evolution and complex adaptive systems have begun to address development at the macro level and Chapter 3 has highlighted Allen's work (1997) on self-organisation at this level. It describes how towns and cities grow and decline, structuring the landscape, the flows of people and goods and shaping the lives of inhabitants (see also Portugali, 1997 and the development of increasingly complex settlements). The commercial property market, of which the provision process forms part, however, has never really been addressed in these terms. In this context, the present Chapter examines the hypothesis that the property market can be conceived as a complex adaptive system[1], the elements within it that might drive change and whether there are real

[1] As a component with internal structure (a sub-system) within the larger urban system.

benefits resulting from the approach. As noted, it is primarily concerned with the market in which ownership and occupation are separate but does begin to examine the links to the owner occupied market.

Some limited simulation has also been undertaken in this Chapter. Like the structure diagram, it has been carried out to illustrate the potential of systems simulation software rather than to undertake a major quantitative analysis of behaviour. In the first instance, however, the Chapter reviews the little work that has been undertaken in examining the commercial property market in systems terms.

## SYSTEMS STUDIES OF THE COMMERCIAL PROPERTY MARKET

There are only two studies of note which begin to analyse aspects of the commercial property market in system terms. One of these is specifically related to retail evolution (Evans et al, 1993) whilst that of Roulac (1995, 1996a and b) examines the market in more general terms. No formal systems analysis has been undertaken in either of the studies, however.

The Evans work really relates to the evolution of retail systems per se rather than to the provision process for retail space. However, it does provide a useful explanation of change in retail institutions and of the agents of change. It will be discussed no further since any impact of the study on the fabric of retail provision is only indirect.

Roulac, however, begins to place the property market and property market cycles in the context of evolutionary economics. His 1996a paper essentially points out the dangers of

adopting an equilibrium approach to property market cycles and notes that, ultimately, the real estate cycle is the result of human behaviour as well as organisational action and interaction. He notes that "while immediate levels of economic activity influence the demand for space..... the more important economic consideration is how changes in the structure of economic activity may introduce new space using patterns and alter demand. This critical economic consideration is not reflected in conventional statistics that report on economic activity, even though it is the most significant economic factor for real estate participants".

In addressing the issue of change, Roulac notes the distinction between "first order change" which involves modification of the existing system and "second order change", which involves a change to a different state or condition. These ideas almost (but not quite) match the distinction between evolution and self-organisation outlined earlier. He undertakes no detailed analysis in systems terms but does outline five critical interdependent forces which impact on property market cycles. These are:

- Economic structure, which he notes is determined by the emphasis and organisation of economic activity and resulting space using patterns.
- Space demand, defined by the desired amounts and type of space to support the level of economic activity.
- Space supply, reflected by the volume of space in a market.
- Capital flows, expressed by investor preferences for real estate relative to alternative investments and among different property types, regions and investment positions.

- Investment performance, measured by property returns, risks and value (resulting from the interactions of economic activity, space supply and demand and capital flows).

Although this very much reflects equilibrium models of the property market, it does go beyond a simple supply/demand view and importantly encompasses economic structure. He also notes some of the economic forces that transform property performance. For the office market, which the present study mainly addresses, he notes:

- Advances in communications technology.
- Corporate downsizing.
- Working at home.
- The expansion of financial services.
- The expanding role of women.
- The expansion of professional services.
- Suburban office development.

All of these are difficult to incorporate into mainstream economic analyses of the property market.

Although Roulac does not analyse the property market in systems terms, he does undertake what he calls an analysis of the strategic real estate framework (1995 and 1996b) and recognises a property market system. In these models he attempts to "provide a means to

connect the micro level tasks of property operations, the negotiation process of real estate transactions and the larger forces that define space use and place decisions". As part of this process he analyses the decision processes of various actors in the property market and, importantly, the systems interdependencies of market participants. His analysis is reproduced in Appendix 6. Unlike the present study, this considers both owned and 'managed' property. Whilst it usefully outlines the important relationships between actors, the analysis is limited in terms of analysing feedback, cause and effect and interactions with the system environment. However, it does act as a useful pointer to inter-dependencies and provides a useful input into the systems structure diagram outlined in the next section.

## A STRUCTURE DIAGRAM FOR THE COMMERCIAL OFFICE MARKET

Drawing on the various sources in Chapter 2, which encompass equilibrium, agency, structure and institutional models of the market, it is possible to construct a systems model of the commercial development process (Figure 4.1). This is not presented as an original model in the sense that it very much reflects a mainstream view of market operation. It is a view of market operation according to which development activity is initiated by demand, to which supply responds by producing development. Actors define and pursue their strategies, interests and actions within a context set by market signals, in particular by the price mechanism. However, it tries to integrate agents in a structure that reflects the cause, effect and process of this mainstream approach[2]. In addition, it attempts to reflect the dynamic of the system using the principles of dynamic feedback. It does this through the

[2] And thus adopting Healey's (Chapter 2) suggested approach of connecting actor based or institutional forms of analysis with relevant perspectives from economics, in this case mainstream economics.

positive and negative feedback loops in the sub-systems. It is presented as a first step in an on-going analysis of that part of the commercial property system which relates to the provision of offices, and for which ownership and occupation are separate.

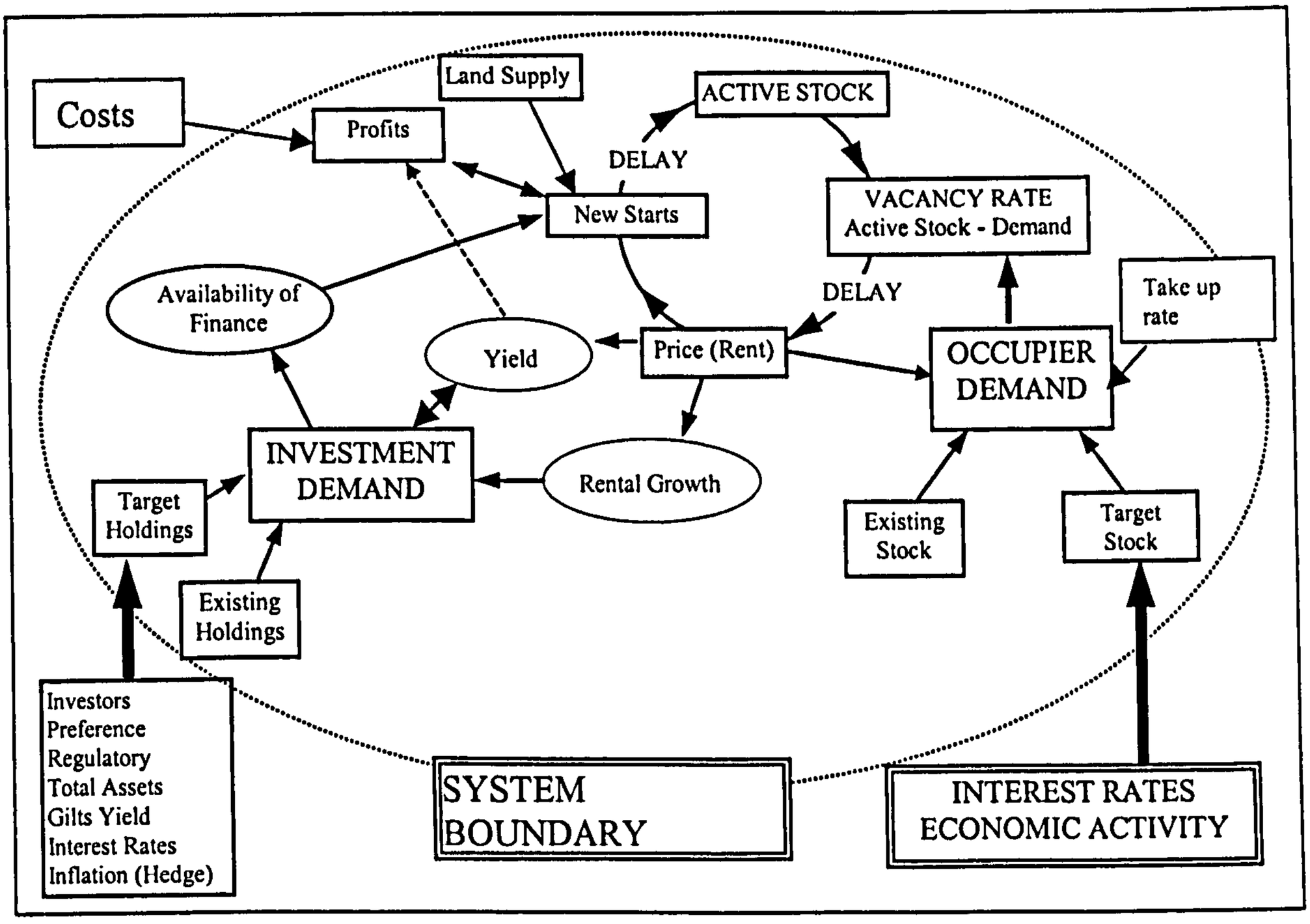


**Figure 4.1. System structure diagram, ownership and occupation separate**

The system is conceived as being open. It can interact with its environment across the system boundary to reduce configuration entropy and to achieve steady state stability rather than static equilibrium. In this sense, the main negative feedback loop may be trying to move supply and demand into equilibrium but constant interaction with the environment at

all levels of the system (not just through the demand sector) will be shifting the equilibrium point, which may never be achieved[3].

Although it is designed to reflect the office market specifically there are many features that are common to the other commercial sectors. The system is represented in terms of four sub-systems – occupier, investment, development and land. The first three of these have been used previously by a variety of authors in descriptions of the market (for example see Key et al, 1994 and Keogh, 1994). Land, however, is normally treated as an exogenous factor in property market analyses. Is included in the system here because it is crucial to the supply process.

Like other studies, factors such as GDP, interest rates, regulatory controls, performance of equities and bonds, and the cost of finance are treated as exogenous factors and have been placed outside the system boundary.

The connectors in the diagram indicate either the communication of meaning (transmission of information) from one factor to another or that one factor influences the behaviour of the factor to which it points. These are not mutually exclusive.

[3] As Allen (1997) notes any system will have corrective forces that swing into action every time the system is pushed away from its stationary state. However, in the case of open complex systems the dialogue between existing configurations and local fluctuations may succeed in carrying off the system to some new spatial configuration.

## The Supply/Demand Cycle

The supply/demand cycle is represented as the primary feedback loop in the system. It accepts the view that the driving force for development is profit and that stock adjusts through a price (rent) adjustment mechanism. The supply of vacant property (termed active stock, or the stock available for letting) interacts with occupier demand to determine the level and growth of rental value through the vacancy rate[4] (for a further discussion see Key et al, 1994, Gardiner & Henneberry, 1988, Keogh, 1994). The adjustment process in the loop includes delays for both the development lag and for rents to adjust to vacancy rates. The feedback loop is of the negative or goal seeking type. When there is a difference between the desired and actual states of the system (the desired state is reached when there is no difference between the stock desired and the stock available), actions are generated to eliminate the difference.

The diagram makes explicit the implication in some studies (e.g. see Barras & Ferguson, 1987a and b; Rosen, 1984; Wheaton & Torto, 1990; Hendershott, Lizieri, and Matysiak, 1997, referenced in Chapter 2) that occupier demand is affected by price. It does this through a negative feedback loop from price to occupier demand[5]. Demand is distinguished from take up rate and is interpreted as the amount of floor space actually required. It is shown as the factor that interacts with vacant stock to drive rents (see above). Take up rate, on the other hand, is perceived as being the extent to which stock is actually removed from the market. The distinction is equivalent to the difference between total market demand and

[4] The difference between active stock and occupier demand.

[5] The validity of this approach is tested in Chapter 5

the quantity demanded at a particular price. Total market demand will be affected by economic and operational factors whilst take up rate is likely to be determined by a variety of factors including price, preferences and expectations (e.g. of future price increases).

## The User Market

The diagram has analysed the link between economic activity and user demand for property - a process generally aggregated in existing models of the market.

In the long run, property stock and the market will expand or contract according to the amount of floor space sought by occupiers. Operational features largely determine the way in which space is used and occupier demand will be a function of the existing floor space users occupy and their target rate (total space requirements). These are shown as separate inputs into overall occupier demand. Target stock will be influenced by sales and profit through a positive feedback loop i.e. if production in any sense is booming then the requirement for floor space is likely to increase (see Figure 4.2). This will be influenced by the exogenous variables tax, interest rates and overall economic activity. Floor space requirements will be limited by cost through a negative feedback loop. Existing stock requirements will be influenced by occupation and maintenance costs that affect quit rates (Figure 4.2). The latter is also affected by changes in technology and change of use that will affect operational requirements for total floor space and floor space of a particular type. Lease conditions will also affect existing stock requirements and the overall flexibility the occupier has to move. All of these will affect the overall demand for new property.

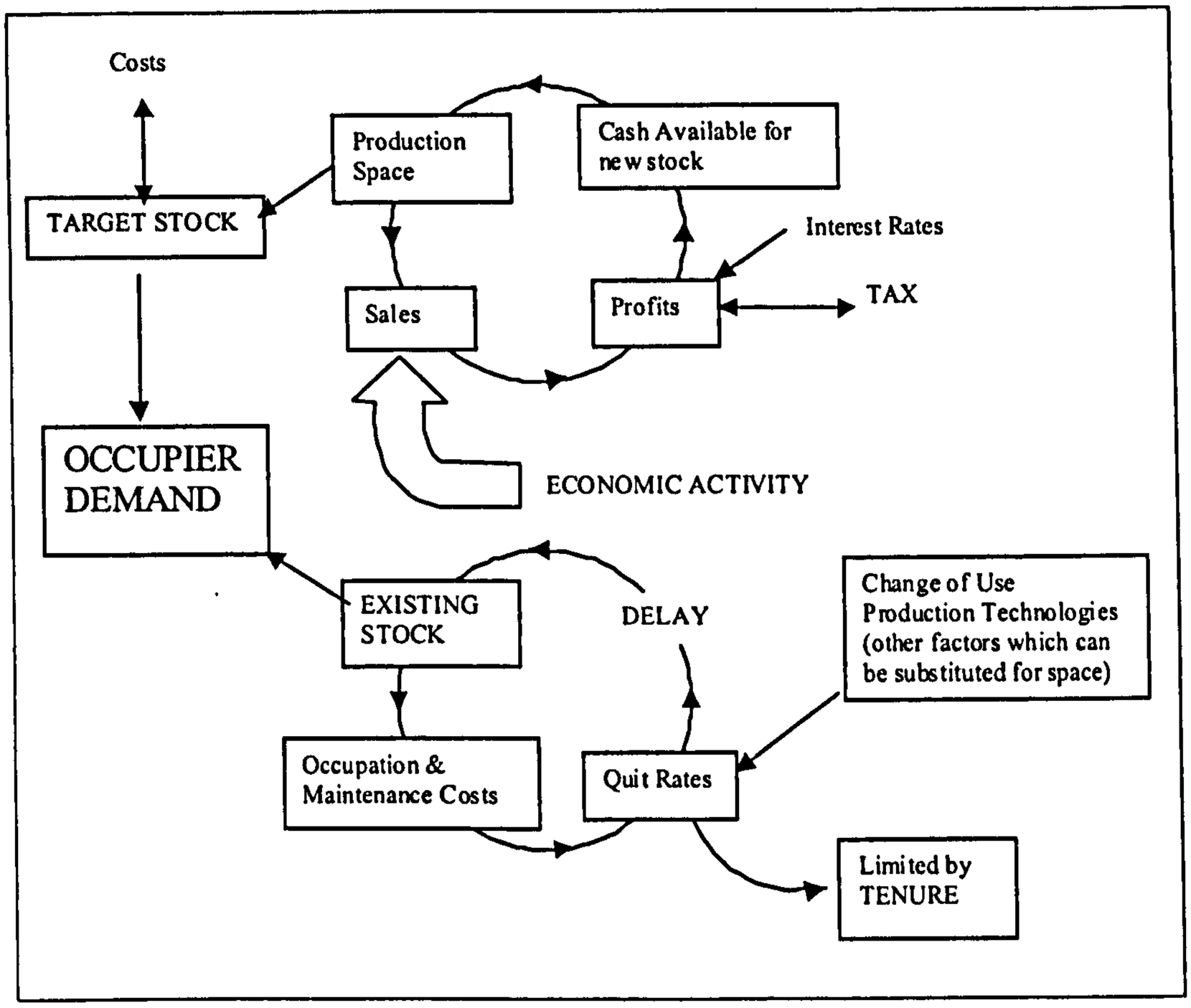


**Figure 4.2. Components of occupier demand**

## New Development and the Links to Rent, Yield and Land Supply

The complex link in Figure 4.1 between rents, yield, investment demand (stock requirements) and development activity is as important as the basic supply/demand loop. Development value, which impacts on profit, is derived separately in the diagram from rents, through the supply/demand cycle, and from yields which have been linked to rents. This separation is important in terms of understanding process. A development appraisal is more likely to estimate development value on the basis of rents and yields than on a direct comparison of capital value. Activity in the investment market will establish the capital value of financial interests in property but conditions in the market are most readily indicated by current yields on investment property, while values are frequently assessed by

reference to prevailing yields (Keogh, 1994). Its usefulness as an indicator of value depends on both the level of rents and the prospects of rental growth. Nonetheless, yield provides a powerful indicator of market developments and as such has been used with rents as the indicator of capital value.

In general, use and investment values will move together (Keogh, 1994), so that development activity will react to their combined influence, but developers may react independently to either rental or yield movement depending on their assessment of the market. Figure 4.1 has attempted to represent these views in the links from rent and yield to profit and in the link through rental growth to the investment market. High and rising rents may be expected to underpin investor confidence in income growth, driving asset prices up, yields down and investment demand up. The latter will impact directly on the availability of finance.

In support of the approach Keogh (1994) notes that in the early 1970s rising rents were reflecting the strength of the user market, while yields were falling in response to both increasing investor confidence and both effects stimulated development through their impact on capital values. However, the upturn in development in the mid 1980s appeared to have been a response simply to rising rents. Development took place despite rising property yields and a lack of institutional investment interest. The boom was user led aided by the availability of finance.

New development will be limited through a negative, compensatory, loop to profit by the exogenous input "costs" and by a number of other exogenous variables including land supply and regulatory factors, such as planning. This is shown in more detail in Figure 4.3.

***Land release***

In the case of land, the structure diagram (Figure 4.3) uses a negative feedback loop to drive land release through land value. The loop is meant to convey the notion that increases in land availability will reduce land values and hence reduce land release (and vice versa).

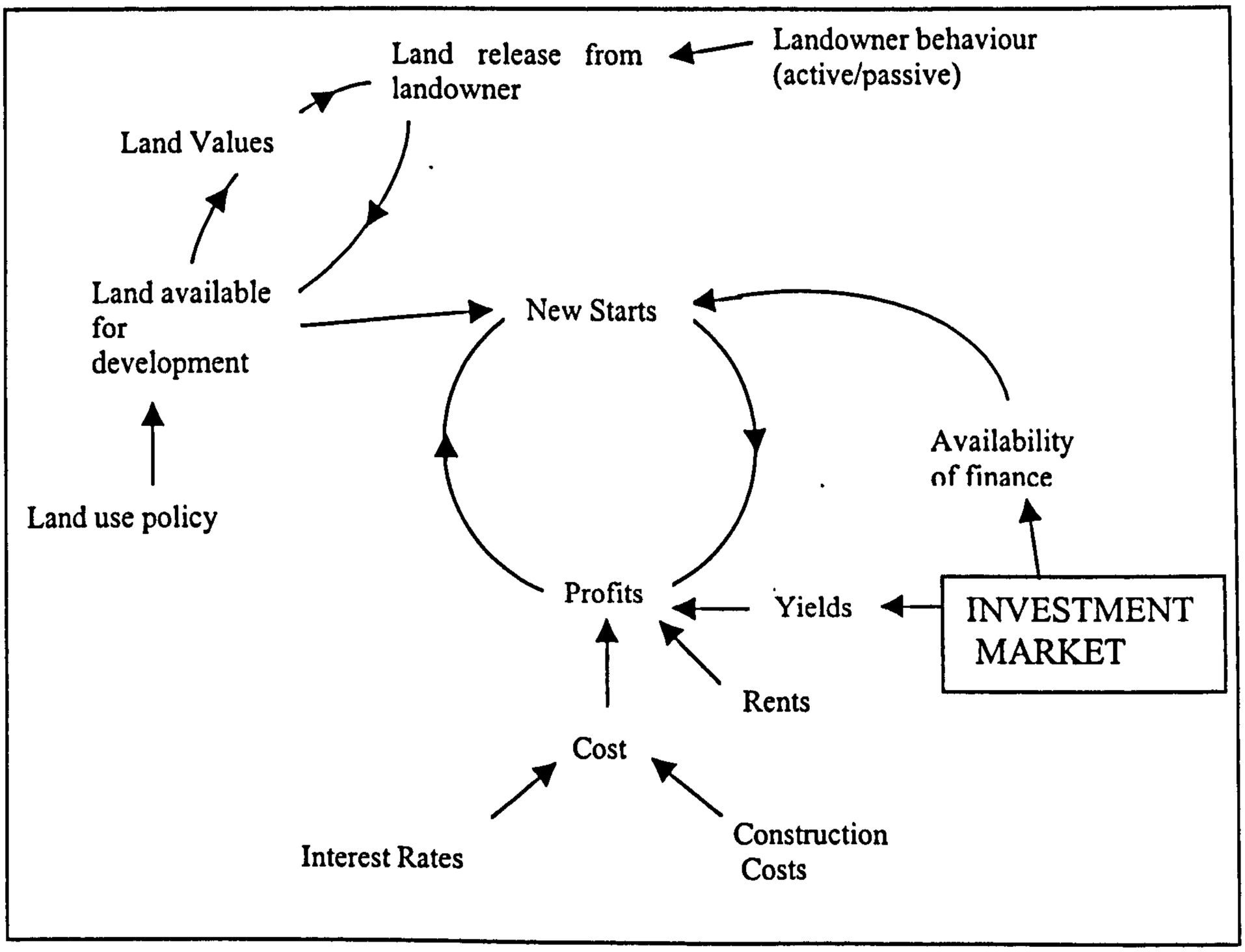


**Figure 4.3 Components of supply**

Central and local government policy impacts on land available for development. Landowner behaviour will impact on land release. In this context, Adams (1994, p 103) outlines the difference between active and passive landowners. The former develop their

own land, enter into joint venture developments or make land available for others to develop. In contrast, passive landowners take no particular steps to market or develop their own land even though they may intend to do so in the distant future. They may respond or fail to respond to offers from potential developers. Such decisions inevitably will be affected by land values. However, the link between land availability and land release need not, per se, operate through land value. Thus in some cases the latter may only have a small part to play in the process e.g. where land is developed for reasons other than pure profit (see later). It is suggested that such behaviour requires strongly active behaviour on the part of the landowner.

A distinction is made between land available for development and land release since it is conceivable that land-owners are prepared to release land for development but restrictions are placed on any development by local or central government.

**Investment Market**

Investment demand is shown to be a function of existing stock holdings and target stock holdings. Each of these will be dependent upon how well property is performing. In the case of existing stock, decisions will be made on individual properties. In the case of target stock, policy decisions on asset allocation will depend upon the performance of property overall compared to other investments and a variety of other factors. The two factor input to investment demand attempts to distinguish these different policy making processes which both, ultimately, impact on the overall investment demand for new development.

## Systemic Characteristics

Steiss (1974) was quite clear that it is not sufficient to simply assemble a set of variables together and call it a system. In this context, Chapter 3 outlined certain criteria that need to be satisfied in order to accept a structure as a system. The structure outlined in Figure 4.1 holds up well against these criteria. In the first instance, it has goal directedness, in that it relates to the provision and exchange of property. Secondly, it has the ability to operate on a series of inputs e.g. exogenous factors such as GDP, to produce outputs e.g. the demand for floor space, prices (rents) and new development and it has connectedness - the structure reflects the elements, interconnections and feedback loops present in reality[6]. Thirdly, there is communication (of information and meaning), exhibited in the feedback loops incorporated in the system that regulate and control behaviour. Finally, there is hierarchical control, whereby the structure has different levels of complexity and new functional relationships are imposed by each level on the detailed dynamics of the level below. Thus the system imposes behaviour on the development, occupier, and investment markets, as well as land, and these in turn impose dependent dynamics on component behaviour and vice-versa). Importantly, the system is part of a wider urban system which itself imposes dynamic relationships on the commercial property market. This is the hierarchy of development noted in Chapter 2 and Chapter 3.

[6] Reflected in other studies of the market, but in this case dis-aggregated.

## SIMULATION

The simulation modelling concepts outlined in Chapter 3 and Appendix 5 have been used in Appendix 7 to construct a simple supply/demand model of the property market based on Figure 4.1, using the simulation software *ithink*. Like the structure diagram there are no great claims for this simulation model. It is there for illustrative purposes and demonstrates the ease with which such models can be put together once the language is understood. Importantly, it allows a pictorial conceptualisation of the processes being modelled prior to constructing reductionist equations to model the relationships.

It has been a conscious decision not to carry out any detailed quantitative modelling of the property system as described since like other quantitative techniques there is a danger of falling back into purely quantitative approximations of market behaviour at the expense of understanding. The important focus at this time was deemed to be general systems theory.

The simulation model, like the structure diagram, reflects a main stream economics view of market processes. The components and the relationships as described represent only one possible history and are only one adaptive solution for the commercial property market in the UK to date i.e. that reflecting a main stream economic scenario in which there is a preference for renting commercial property. They are static snapshots of a market and market processes, which have changed and will continue to change with time. An examination of this other systemic characteristic (adaptivity) is as important as the analysis undertaken above and the premise that the market behaves as a complex adaptive system

cannot be fully explored without some examination of historical change. This is undertaken in the next section.

## STRUCTURAL CHANGE IN THE PROPERTY SYSTEM

There is strong evidence of structural change, and with it emerging complexity, in the property market system over many years. This is recognised to some extent by a recent study of property cycles in the UK (Key et al, 1994). Implicit in the underlying theme of this study is the idea that *there is something fundamental in the structure of the post war property market* that has contributed to the property cycles of the last thirty or so years. It notes, "in some key features, the market in its current form dates back only twenty five or thirty years - most obviously with respect to the terms of the standard lease, but also in terms of the size of the investment market, the number of participants in it and how they make their investments. Before the 1960s, the values of properties let on long leases, with less frequent rent reviews, will not have reacted to changes in the economy in the same way as properties let on the standard institutional leases typical of later years. The structure and financing of the development industry have also changed ... accordingly, the property cycle of the last thirty years is likely to be different from any that existed before 1960" (Key et al 1994, p9).

There is a clear recognition of the process of change and some recognition of its impact on behaviour, although no detailed study of systemic change was carried out. A detailed study of this process is also beyond the scope of the present work. However, given the importance of change to the overall systems approach some analysis has been undertaken using the studies of Scott (1996) and Powell (1996) as the main historical sources. This

novel analysis of historical change examines how the system has been shaped by the interaction of components with the system environment and restructured by the making and breaking of feedback loops.

## Historical Change in the Property System

It can be argued that changes in the market structure did not occur suddenly. Scott (1996) and Powell (1996) detail a process of (irreversible) change in the UK property market stretching over a period of almost two hundred years. They describe the transformation of property from a *'social institution to a financial asset'* and the slow displacement of a system of estate management by the landed gentry and traditional institutions[7] which had characterised the market up to that point. They also chart the increasing involvement of the institutions through a process of structural change that is consistent with a systemic response to changing external conditions, including inflation and the rapid sociological changes that occurred in the 19th Century, creating an increasingly complex system.

### *The early market (1800 to 1850)*

No commercial property or investment market as we know it existed in the early 1800s. Traditional landowners might buy, sell or develop property to consolidate and improve relatively fixed estates but did not undertake investment on the basis of purely financial considerations (there was no switching of resources between securities with the sole aim of maximising profits). A major factor was that elaborate statutes or settlements usually prohibited the sale of land and, as a result, they appear to have pursued policies that were

[7] Crown, church, educational and charitable institutions.

more akin to the estate management of holdings. Urban land holdings were developed when the opportunity arose, by the granting of building leases[8].

Despite these fundamental differences to the modern market, many of the actors involved in the provision of buildings in the early 19th Century would be recognisable today. Landowners, investors, developers and builders were all part of the market system, although often one person combined the roles of several while methods changed from place to place (Powell, 1996; Scott, 1996).

Although commercial property was not yet 'commodified', and no well defined supply/demand cycle existed, components of the system were evolving and a number of factors came together during the first half of the 19th Century which would ultimately precipitate structural change in the market. Environmental factors, in particular economic growth and the expansion of manufacturing and financial services, encouraged new types of commercial building to emerge and evolve. Banks, insurance offices and allied businesses increasingly built new premises in the City of London and in leading provincial towns (Powell, p15). It was during this period that many of the financial institutions present in the market today were founded (Edinburgh based Standard Life Assurance Company for example was founded in 1825). The insurance companies were amongst a group of investors who were not encumbered by tradition or existing holdings and who did take an

[8] A long-term lease (generally 99 or 999 years in length) imposing an obligation on the lessee to erect one or more buildings on the leased land, which will become the property of the landlord after the lease expires.

active role in the urban property market. This early example of micro-diversity in behaviour was to have profound, lasting, structural effects.

From 1840 the pace of estate development increased due to changes in the law relating to settled estates and to charity and ecclesiastical land, allowing its development via building leases. This increasingly encouraged the practice of development for profit by landowners. Conditions were being created for the easier development of private land.

***The transition from social institution to financial asset (1850 to 1870)***

Scott argues that property really began the transition from social institution to financial asset over the twenty years from 1850 to 1870. This may be examined in terms of both external (environmental) and internal (structural) pressures.

Environmental pressures

Environmental pressures, resulting from a growing national economy, increased the demand for new commercial and residential buildings. This economic growth and the concomitant increase in the accumulation of capital and the size of the companies that were accommodated also increased the average scale of building projects. Ultimately this would influence the funding sources for projects although at this stage most promoters continued to be local people operating in their home towns (Powell, p48). Another major environmental factor that would ultimately contribute to structural change was a growing middle class (and a concomitant growth in middle class savings) with concerns almost exclusively relating to financial return rather than non-monetary factors. The result was that savings began to be channelled into property sectors. At the same time there was a growth

in property companies and indirect investment in property[9], a growth in the property investment market per se and with it the development of market intermediaries and a market press[10].

Internal structure

In terms of the **internal structure** of the market, insurance companies began to take an increasingly active role in the urban property market during this period. There had been little direct investment before 1870, but there began now to be a switch in funds from Government stock to mortgages. This resulted initially from aristocrats borrowing on the security of agricultural land but, as the century progressed, loans on urban property formed a growing proportion of mortgages[11]. One of the earliest companies to become involved in property was Standard Life Assurance Company. They appear to have made a direct investment in land as early as 1852, using the value of land *as a hedge against inflation* (Scott, p15). Other institutional players included The British Empire Mutual Life Assurance Company (from 1866) and Royal Exchange Assurance (from the 1840s).

Increasingly, potential promoters weighed returns from investment in buildings with other investment media (Powell p50).

[9] The first property company was founded in 1845.

[10] Vital sources of information for an investment medium characterised by a lack of a central market place.

[11] Short term credit for speculative development included mortgages given by solicitors, insurance companies and building societies (Powell, p57).

These factors contributed to the changing nature of property investment *and financing*. Importantly from a structural point of view, micro-diversity in investor behaviour (particularly the insurance companies) interacting with environmental factors (which included the great social changes of the period and increasing middle class investment patterns) created structural investment links with the property industry and began to commodify it. External forces had brought new actors to the game and the nature of existing relationship were beginning to change. These new actors were not yet dominating the play but they would influence the market structurally in the future through their direct involvement in property and involvement in short term finance. There is also *prima facia* evidence that the supply/demand feedback loop involving rents and new development was now operating in London and Liverpool. Thus London, which had seen its first speculative office block constructed in 1823, was, by 1860, experiencing a situation in which demand for office space around the Bank of England was high and diminishing supply of available sites was leading to rising land values (Scott, p22).

***The strengthening of links (1870 to 1918)***

Links between the investment market and property continued to strengthen over this period. There was extensive involvement by the insurance companies in the property market with regard to low yielding secure investments and there was a move towards a more active investment policy on the part of a few companies[12]. Direct investment in property offered a means of placing money at substantially higher yields than could be obtained on consols or

[12] This was at least partly due to a period of 'cheap money' leading to a decrease in mortgage lending and a rise in direct investment in property, Scott, p27.

mortgages, and during this period the proportion of insurance company funds invested in land, property and ground rents nearly doubled (Scott, p28).

In the 1890s the Royal Exchange Assurance, the National Provident Institution and Clerical, Medical and General Life Assurance Society (founded in 1824) began to purchase freehold ground rents and began to invest in buildings per se by the early 1900s. Importantly, in a structural sense, some of Clerical and Medical's early property investment deals involved co-operation with potential tenants using techniques that were to develop during the inter-war years (Scott, p21).

***The development of the modern market (1918 to 1939)***

Although many features of the modern property market, per se, existed in one form or another by the end of WWI, the inter-war period was to have the greatest impact on the structural development and behaviour of the property investment market. Many basic features of Britain's modern property investment market appeared in the years 1914 to 1939. These included:

- The growth of intermediaries.
- Securitisation[13] of investment property.
- Development of funding links between funding institutions and property developers.

[13] The conversion of assets into tradable securities.

Funding now came from banks and sale of shares rather than local capitalists (Powell, p110) and a large number of transactions provided a steady stream of investments. These changes were driven by a number of important **environmental factors**, including population growth and a changing middle class, which were driving up funds available for investment[14]. In addition, there were increasing demands for property from expanding multi-retail (chain store) businesses[15].

Scott suggests that the growth of multiple retailers, together with the associated development of nationally based property market intermediaries were particularly important. He argues that this created the conditions required to persuade institutional investors to undertake a substantial volume of direct property investment. These conditions included (Scott, p38):

- The growth of an efficient and integrated market covering the geographical area in which investments were situated.
- The development of a scarcity premium for particular properties resulting from location.
- The development of a financial climate in which commercial enterprises had considerable incentives to rent rather than own their business premises, or to

[14] From 1922 to 1937 the funds of UK based life assurance companies doubled from £804M to £1665M.

[15] Powell (p110) notes that the overall numbers of department stores increased from about 200 in 1914 to over 500 in 1938 and the multiple chain store Woolworth from 81 stores in 1919 to 768 by 1939.

dispose of some property rights to their premises in return for an immediate capital gain (eg sale and lease back).

In addition, the Government's cheap money policy during the 1930s allowed a final condition for the growth of a property investment market to be satisfied viz. the emergence of a significant differential between the performance of property and alternative assets. This was required to overcome property's inherent disadvantages (lack of marketability, uncertainty of value, indivisibility and higher management costs).

Of these conditions, only that relating to preferences for renting directly affects structure in the systems sense (the others represent environmental factors impacting on choices, or micro-diversity, in the 'existing' and 'target' holdings components of the investment market). Even then post hoc (historical) preferences had already developed- from an earlier system that largely reflected the preference for owner/occupation. At some point there was a bifurcation of the common system into two systems, one reflecting the preference for leased property and one for owner/occupied property. The nature of the financial climate that allowed this to happen is therefore of particular interest, although the data to describe it is scarce. The issue is discussed at more length in Appendix 8.

Despite the major changes in attitude during this period, investment property still constituted a virtually fixed interest asset, since it was still subject to long leases at fixed rents. Property activity increased, however, because it offered a yield of around 2% higher

than consols and offered more stability than equities in generally unstable economic conditions. The structural link to other investments had become firmly established.

***The post-war period: The final transition to a commercial property market***

The final transition to a commercial property market occurred in the post war period up to the early 1970s. Strong demand pressures, particularly in the early part of this period, resulted from the destruction of commercial space during WW2, and the pent-up demand for space from before the war[16].

Three powerful themes dominated the behaviour of building promoters (Powell, p140/141):

- An increase in the scale and pace of building, (intensification)
- The expansion and grouping of promoters into large organisations - independent of any trend in the property market (concentration), for example manifest in:
  - The emergence of large public authorities and multinationals.
  - Growth amongst other smaller companies.
- A greatly extended capacity of the State to influence decisions to build (intervention).

In addition, the period saw the rise of property development companies engaged in comprehensive central area redevelopment. The emergence of modern funding packages is also evident whereby developers initially raised short term loans from clearing banks of up to three years and (later) from merchant banks and the issue of stocks and shares (Powell,

[16] In the late 1950s commercial building accounted for one tenth of the total value of building and construction output.

p146). In the longer term, capital from insurance companies, pension funds and property unit trusts frequently became involved. In this context, Clerical and Medical around this time began forming joint development companies with property developers allowing them to obtain lessor scheme properties as direct investments in addition to revenue from shareholdings in, and loans to, these companies (Scott, p126). Powell also notes that the success of the private developers encouraged Local Authorities and Institutions to become involved (successfully) in partnership deals in order to share in the gains to be had in a mostly sellers market. Importantly "*the traditional roles of developer, short term financier and long term financier merged as they adapted to a fast moving field to pressures of inflation and the desire to secure better yields*".

By the late 1960s not more than one fifth of new offices were built by their intending occupiers. The remainder was being supplied by developers through the open market (Powell, p146)[17]. Here "was a growing trend for private sector promoters to be concerned with the exchange value of their buildings rather than use value. Here also was the evidence of the move away from naïve promoters occasionally commissioning their own premises, towards sophisticated promoters building speculatively for the market, as had been long common in housing" (Powell, p146). During this period there was also an intensification (scale and pace) of property investment by the insurance companies which had been active in the sector during the 1930s. There was also a substantial expansion in the number of insurance companies that undertook investment in this area.

Up to the mid fifties property continued to be a relatively high yielding fixed-interest security which was of considerable attraction to institutional investors at a time when cheap money amongst other things led to a shortage of assets which offered attractive yields. Property investments were still fixed interest assets, and 99-year leases were still common with no rent reviews. However things were changing. Interest rates and yields increased in the early 1950s but so did inflation. Scott (p109) notes that institutional investors were slow to realise the threat which inflation posed to fixed-interest stocks[18] (the boiling frog), but when they did they were to change the market in a fundamental way and one which is with us still.

Many investment managers still thought in terms of initial yields and the security of capital invested rather than future income growth, and did not regard inflation as a long term phenomenon which had to be taken into account in investment decision making. However, the persistence of inflation during the 1950s, and a growing appreciation among institutional investors of the potential which property offered as an equity investment, led to the introduction of the rent review. This was (is), an upward only adjustment of rent paid for a property, to market levels, at intervals stated in the lease. The first rent review changes began to appear around 1955 and the next 20 years saw a steady reduction in the interval between reviews until the present pattern of 5 yearly rent reviews became established in the

[17] Concentration of ownership and building promoters was at its most evident in retailing, where national chains expanded.

[18] As early as 1951, however, Legal and General did view property as an asset capable of income and capital appreciation rather than simply a fixed interest security. Likewise the NCB Pension Fund and the Church Commissioners were also aware of the possible effects of inflation. By 1954 these three not only perceived the dangers of inflation but were also looking at ways to build an equity element into property investment. It took most other institutional investors several more years to reach this conclusion (Scott, p110).

early 1970s. In addition, average lease lengths fell from 99 years in the early fifties to 25 years by the mid-1970s to around 15 years by 1995 (see also Chapter 5).

Many of these later changes are not structural in the systems sense. The structural links had been developed long before. They are important, however, in that they exhibit a developing micro-diversity in renting and lease patterns being driven by economic pressures. An important consequence of this behaviour is that it is creating instability in the market as exhibited by increased market volatility (less likely under conditions where average leases are 99 years!). This instability may be a precursor to structural change and different possible futures for the market. As noted in Chapter 3 the impact of such micro-diversity forms an important area for future study. Time limitations preclude detailed analysis here but one scenario that would repay investigation might be that related to the consequences of shortening leases in terms of the impact on feedback loops to the investment market and long term investment opportunity. The consequences of this might include a move back to owner-occupation with funding through long-term mortgages.

## CLOSING REMARKS

The Chapter has attempted to place the property market, and with it the commercial development process, in the context of general systems theory. It has examined the processes involved in the provision of the built environment and treated them as a complex adaptive system and has examined historical change in terms of structural change as part of this complex adaptivity. A process of increasing complexity and irreversibility has been described which stretches back over 200 years and which saw property transformed from "a social institution to a financial asset".

There are some clear benefits in adopting this approach. These may be summarised on two levels. On one level general systems theory offers a powerful alternative for interpreting market behaviour. Specifically:

- It offers a real worldview that can integrate information from different disciplines and domains in a multi-dimensional framework.
- The concepts of complex adaptive systems and non-equilibrium structural change offer a sound methodology for understanding change and address the contention (Ball, 1998) that structural change cannot be greatly affected by agency behaviour. It does this through the notion that micro-diversity in the components of the system (including the actors) can interact with the system environment to bring about change.
- The concept of structure as the key relationships that influence behaviour over time offers a way of reconciling the duality of structure and agency with the dualism implicit in the structure/agency approaches to the property market. The actors and components of the system **are** the structure and are part and parcel of the determinants of present and future behaviour[19] If required, the system structure could integrate social and cultural aspects of actor behaviour.
- The approach recognises the importance of systemic structure in determining the reaction of the system to exogenous influences.

---

[19] Compare Ball, 1998, where such issues were resolved by incorporating organisations and markets in the relevant structure of provision).

- The approach recognises that there may be a web of inter-dependencies that determine behaviour (through the feedback loops). A component can often, in practice, operate both in a control function and in a dependent function. The behaviour of a particular component will be the outcome of multiple competing factors that are difficult to represent in concise linear terms. Understanding these offers a way of analysing the relationships that generate behaviour rather than just correlating the factors that *influence* performance.

On a second level, the structure diagram presented in Figure 4.1 has some benefits compared to the models reviewed in Chapter 2. Specifically:

- It allows a better definition of exogenous and endogenous factors through the definition of a system boundary that incorporates land.
- It attempts a dynamic analysis. Hitherto, descriptions of the market have been 'static' and generally do not accommodate the feedback responses that may alter the decision making process on a continuous basis.
- It captures the essential processes at work but in terms of causal links. In particular, it offers a way of modelling price elasticity and the basic supply/demand cycle and highlights the complex dynamic links between rent, yield, investment demand and development activity as well as the part that lease terms play in determining market demand.

- It highlights the need for local studies such as that described in Chapters 5, 6 and 7 of this work. Agents can never be perfectly informed and they have (at best) to optimise locally rather than globally.

This structure diagram has been produced mainly for illustrative purposes and is based on a mainstream economic view of process. This is not meant to be all embracing or definitive. No doubt it needs development, but it does illustrate the potential of the systems approach as an aid to understanding and helps to resolve the issue of structure and agency in property market models. In addition, it unravels some of the process aggregated in existing models of the market and attempts to reflect the dynamics of the system. It also forms a basis for examining future change. Understanding the property market system and its dynamics is a first step in understanding such issues and the study of the Edinburgh market described in the next three Chapters has been undertaken with this in mind.

## REFERENCES

Adams, D. (1994). *Urban planning and the development process.* UCL Press, London

Allen, P.M. (1997). *Cities and regions as self-organising systems: Models of complexity.* Gordon and Breach.

Barras, R. and Ferguson, D. (1987a). Dynamic modelling of the building cycle: 1 Theoretical Framework. *Environment and Planning A,* **19,** 353-367

Barras, R. and Ferguson. D. (1987b). Dynamic modelling of the building cycle: 2 Empirical Results. *Environment and Planning A*, **19,** 493-520

Evans, K.R., Barnes, J.W. and Schlacter, J.L. (1993). A general systems approach to retail evolution: An existing institutional perspective. *International Review of Retail, Distribution and Consumer Research*, **3(1),** 79-100

Gardiner, G. and Henneberry, J. (1988). The development of a simple regional office rent prediction mode. *Journal of Valuation* **7,** pp36-52

Hendershott, P.H., Lizieri, C.H. and Matysiak, G.A. (1997). The workings of the London office market. Reviewed in Ball, M., Lizieri, C and MacGregor, B.D. (1998). *The economics of commercial property markets*. Routledge, London and New York

Keogh, G. (1994). Use and investment markets in British real estate. *Journal of Property Valuation and Investment*, **12(4),** pp58- 72

Key, T., McGregor, B., Nanthakumaran, N. and Zarkesh, F. (1994). *Understanding the property cycle: main report,* RICS, London

Portugali, J. (1997). Self-organising cities. *Futures*, **29(4/5),** 353-380.

Powell, C. (1996). *The British building industry since 1800: An economic history*. Spon. 2nd Edition

Rosen, K. (1984). Towards a model of the office building sector. *AREUEA Journal*, **Fall,** 261-269

Roulac, S.E. (1995). Strategic decision models: Multiple perceptions, unifying structure. *Journal of Real Estate Research*, **10(5),** 495-508.

Roulac, S.E. (1996a). Real estate market cycles: Transformation forces and structural change. *Journal of Real Estate Portfolio Management*, **2(1),** 1-17.

Roulac, S.E. (1996b). The strategic real estate framework: Processes, linkages, decisions. *Journal of Real Estate Research*, **12(3)**, 323-346.

Scott, P. (1996). *The Property Masters*. Spon. London

Wheaton, W.C. and Torto, R.G. (1990). An investment model of the demand and supply for industrial real estate. *AREUEA Journal*, **18(4)**, 530-547.

CHAPTER 5

# The Interactive Office Market in Edinburgh, 1987 to 2000

## INTRODUCTION

### The Importance of Local Studies

The analysis of complexity and change in Chapter 3 highlighted the importance of local studies in understanding property market behaviour. Whilst there are important global and national issues impacting on the performance of local markets, all markets are not necessarily alike in their behaviour. The spatial development process, and the provision process through which it operates, are impacted on by many factors in the urban system. In considering these processes, local factors such as the existing spatial distribution, transport infrastructure and the *local* economic situation need to be considered along side common global and national issues. In this context, Chapter 2 highlighted the work of Keogh and D'Arcy who considered that changes in the economic and spatial structure of urban regions are inevitably shaped by local real estate market dynamics. Furthermore, they considered that the characteristics of local real estate culture are important in understanding and explaining the changing character of property markets. Chapter 3 highlighted the work of Andersen who suggested that agents can never be perfectly informed and that they have, at best, to optimise locally rather than globally. A general systems view would also suggest that individuals and their local circumstances are important in determining local configuration entropy and system evolution.

The detailed study of the Edinburgh office market outlined in this and the next two Chapters has been undertaken with these issues in mind. Although the Edinburgh office market is relatively small compared to London and some English regional centres, it is attractive in the sense that it is local as well as being the second largest financial centre in the UK. In any case, it can be argued that the size of the market does not necessarily change the behaviour patterns of the actors, although it may more finely attune them to market signals compared to the situation where development and investment transactions occur on a frequent basis. In addition, the study of a less complex system is worthwhile at this stage in the understanding of systemic behaviour in the property market.

**Outline of Study**

The study has examined the local Edinburgh system in detail with particular reference to the provision of office space. In keeping with the philosophies outlined above, an important element of the work has been to generate a broader understanding of market dynamics and a better comprehension of the changing character of property markets. It has attempted to go beyond a simple economic analysis of the circumstances within which the market operates. In particular, it has aimed to develop a better understanding of the dynamics of office provision in Edinburgh and to develop a better understanding of:

- The relationships between the agents in the development sector.
- The signals given and received between parties to the process.
- The way in which information is communicated and interpreted and the impact of information arrival on the commencement of new development.
- Whether these signals are used to trigger the development process and if so, how.

- The extent to which other factors trigger development e.g. the part the planning system itself plays in triggering development by providing/determining land use opportunities.
- The relative importance of land ownership issues in the development cycle.

In the systems context, the study was also interested in differences between the local system and interpretations based on the mainstream economics view outlined in Chapter 3, and whether differences were due to naturally adaptive processes or whether they resulted from economic descriptions being too simplistic.

There are three main strands to the work:

- **Contextual studies**. These have investigated the pattern of new office build and change of use in the Edinburgh office market over the chosen timescale and placed the dynamics of this provision process in the wider economic and social context. The studies have also examined the impact of rents on provision. Whilst a range of published data on the Scottish market, per se, exist, that for Edinburgh alone is less well documented in the literature. Such data will be of interest, therefore, not only in the contextual sense in this study but as stand alone results on the dynamics of the Edinburgh office market. The study is outlined below and begins with an overview of the office market in Edinburgh.
- **Intensive studies of behaviour.** These studies are considered in Chapter 6 and have been limited to an examination of the behaviour of occupiers and the impact of market

signals on property decisions. Time limitations have precluded a detailed study of investment and developer behaviour although the latter has been examined in the case studies, which represent the third strand of the work.

- **Case studies.** The case studies are discussed in Chapter 7. They examine the two major office developments in Edinburgh over the period of the study, Edinburgh Park and The Exchange, in the context of the parts played by particular agents in the development process (including The City of Edinburgh Council, property developers and other property professionals). They also examine the motives and trigger for development.

## MARKET OVERVIEW

Edinburgh is Scotland's judicial and administrative centre and is the second largest financial centre in the UK in terms of funds under management. It claims the headquarters of three of the four Scottish clearing banks, three retail banks, five of the major life assurance companies, seven independent fund managers, seven merchant banks and three security brokers. Its office market continues to be dominated by the financial, government and professional sectors and estimates of office employment suggest that it is the sixth largest regional centre in Britain (Scottish Enterprise, 1992).

Three important sub-markets can be identified in terms of the interactive Edinburgh office market as a whole. These are:

- Period (Georgian) properties in the Edinburgh New Town, located immediately north and west of Princes Street.

- The market in modern city centre open plan office accommodation.
- From the mid to late eighties the increasingly important office parks on the edge of the City.

These three sub-markets are interactive and conditions in one may be seen to affect performance in the others.

The period properties in Edinburgh's New Town were built in the late eighteenth century primarily for residential use. They have, however, been a major source of office accommodation in the City and until the late 1960s early 1970s, when a few larger office blocks were built in inner city and suburban locations, Edinburgh's office market was primarily located in the New Town area. Nonetheless, difficulties in accommodating new information technology coupled with increasing maintenance costs, rating liabilities and high car parking charges increasingly brought about a spatial change in Edinburgh's office market. The demand for period property declined as modern open plan office space became available.

The supply of modern open plan offices in the City centre was and still is limited by the availability of space. This is exacerbated by the layout of Edinburgh's central core and it's designation as a conservation area. Importantly, however, Edinburgh's City Council took an increasing development role from the late 1980s (see below and Chapter 7), enabling two new business districts to emerge. These were the west central Exchange district and Edinburgh Business Park on a major out of town site.

A fourth sub - market in city (peripheral) offices can be identified which is less important in terms of the interactive nature of the sub - markets but which nonetheless contributes significantly in terms of the overall provision of office space in Edinburgh. New build in this area of the market place represented around 34% (GFA) of all new build over the period 1987 to 2000.

An interesting feature of the market in Edinburgh is the extent of owner/occupation and bespoke building. This is particularly true of the major players in the financial sector who have generally accommodated their headquarters in bespoke property, often owned by the companies concerned.

## OFFICE DYNAMICS IN EDINBURGH OVER THE PERIOD 1987 TO 2000

### Office Floorspace Data Collection

The assembly of floorspace statistics for new build and change of use in Edinburgh has been complicated by the absence of any central system for recording and monitoring the office development pipeline in Edinburgh on a routine basis[1]. Planning data is not routinely linked to building control data[2] despite the importance of the development pipeline to development control decisions. As a result, it is not possible to track the transition from development proposal to actual construction[3] in a simple manner.

---

[1] The development pipeline is understood as buildings in the planning system with outline or detailed permission together with buildings under construction.

[2] The planning application number is not carried forward to building control when warrants are issued. The latter have a completely separate system of recording buildings.

[3] Planning effectively represents a wish list. Building Control data reflects the transformation of wish list to fact.

This problem was addressed in the mid-1980s by the then Edinburgh District Council, who began to record information on offices and retail developments (under construction and in the planning system) on an *ad hoc* basis. The work was carried out by the Economic Development Team, who tracked the development pipeline from mid 1986 until the end of 1996, when the practice stopped as a result of funding pressures. Their data set (henceforward referred to as the CDD data) was put together using planning information and fieldwork to establish whether work was underway on projects.

The CDD data set represents an important source of information on office construction in Edinburgh and has been used as the starting point for the present study. Unlike the CDD work, however, the present work assembled the data set by first identifying new development through building control information (mainly building warrants and completion certificates). It subsequently identified the detailed nature of the development from planning and market information. For illustrative purposes, the building control data for the period July to December 2000 is shown in Appendix 9. Although the building control data does identify when work is undertaken there are a number of limitations in the approach. Change of use (CoU) is automatically be recorded by the planning system. It is only recorded by building control if the change of use is accompanied by a building programme (and for the data set in Appendix 9, only if costs are greater than £200,000). Because of this uncertainty, the CoU data from the CDD set has not been extended beyond 1997. It is also worth noting that completion certificates are issued almost immediately after 'completion' i.e. of the building, not the completion of the warrant. If a warrant is to

'erect foundations' the completion certificate relates to the completion of the building not the completion of the foundations. There will be no completion certificate recorded if:

- The building is not started/finished.
- The building was completed but it has outstanding minor faults to be rectified.
- The completion certificate was not applied for but the building was completed (naughty, but does happen on occasion).

Like the CDD data, the work has supplemented planning and building control data with fieldwork. This has followed the progress of various projects on the ground and checked floor area through building signage and discussions with developers, agents and builders. In summary, the new data set has:

- Reconciled the CDD data with building control information. This was only possible from 1990 when computerised records of warrants and completion certificates began.
- Confirmed the nature of the buildings recorded in the CDD database.
- Amended the CDD list to exclude offices classified as Class 2 under the Use Classes Order (Scotland) 1989[4] and industrial and retail developments, where these had been incorrectly included.

[4] Most offices fall within the Business Class (4) group, which includes among other uses light industry and R&D. The end use may be office or any of these other uses. Both the CDD data set and the present data set aimed at only recording Class 4 offices. Class 2 office proposals have not been included either. These are provided principally as a service to visiting members of the public and include banks, building societies and the like.

- Extended the data to the end of the year 2000.

The data only includes buildings over 200m$^2$ in area (GFA) costing more than £200,000. These limitations were necessary because of the sheer volume of data from Building Control. On this basis some gaps are inevitable (balanced where possible by the market and field studies) but the data gives a good indication of the dynamics of new build in Edinburgh over the period of study. The starting point of the CDD data determined the starting point of this independent data set (1987 was the first full year of the CDD data) and, in the event, the starting point of the whole study described in this work.

The results of this process are summarised in Appendix 10. This lists new office build and change of use as follows:

- The year the development was completed.
- The address of the development.
- The development type (new build or change of use).
- The planning application number where known.
- The Gross Floor Area (GFA) in m$^2$
- The Net Floor Area (NFA, m$^2$) where the primary floorspace data was found in this form. In order to compare like with like, this figure has been converted to GFA using a rule of thumb of 15% circulation space i.e. the NFA has been multiplied by 1.15 to get a GFA.
- The local plan area.

- The initial letting status of the building, where known i.e. whether the building was purpose built (effectively owner/occupied), pre-let or speculatively built.
- Whether the City of Edinburgh Council was involved in the development either directly, as lead developer or indirectly, through the provision of land in partnership arrangements and the assembly of suitable sites.
- Other relevant information.

It is important to note that the data presented in Appendix 10 takes the early CDD data as read. In the case of CoU this includes the summaries for 1987 and 1988, which it has not been possible to check.

**Analysis of Office Floorspace Data**

The floorspace data in Appendix 10 is summarised in Table 1. Over the period of the study a total of around 731,000m$^2$ of office space (GFA) was provided in Edinburgh. Of this around 54% was in Central Edinburgh, around 34%in the outer areas of Edinburgh and around 12% in Edinburgh Park. The outer area figure includes floorspace built adjacent to Edinburgh Park but not formally part of the park (generally on or adjacent to the Sighthill Industrial Estate, see later). The patterns and trends in this data are analysed below.

## Table 1. New office build and change of use in Edinburgh, 1987 to 2000

| Year | Total New Build (GFA m2) | Total Change of Use (GFA m2) | Total New Build By Location (GFA m2) | | | Total City Involvement in New Build (GFA m2) |
|---|---|---|---|---|---|---|
| | | | Central | Outer excl Edin Park | Edinburgh Park | |
| 1987 | 10,550 | 15,396 | 4,853 | 5,697 | 0 | 325 |
| 1988 | 11,986 | 35,301 | 4,782 | 7,204 | 0 | 250 |
| 1989 | 43,290 | 15,994 | 9,688 | 33,602 | 0 | 5,000 |
| 1990 | 69,400 | 14,753 | 51,246 | 18,154 | 0 | 0 |
| 1991 | 82,540 | 23,796 | 59,099 | 23,441 | 0 | 26,232 |
| 1992 | 51,717 | 11,142 | 7,154 | 44,563 | 0 | 35,100 |
| 1993 | 28,387 | 6,191 | 20,220 | 8,167 | 0 | 0 |
| 1994 | 22,147 | 8,210 | 6,863 | 15,284 | 0 | 7,444 |
| 1995 | 66,440 | 9,051 | 20,010 | 35,655 | 10,775 | 29,108 |
| 1996 | 65,955 | 1,040 | 39,230 | 0 | 26,725 | 58,013 |
| 1997 | 30,119 | 5,744 | 21,304 | 210 | 8,605 | 18,755 |
| 1998 | 65,716 | | 48,230 | 17,486 | 0 | 10,965 |
| 1999 | 72,851 | | 16,255 | 24,070 | 32,526 | 54,926 |
| 2000 | 110,423 | | 88,232 | 16,311 | 5,880 | 41,531 |

*The pattern of new build and change of use*

The trends in new build and change of use are plotted in Figure 5.1. This plots the total floor space of new build (GFA m2) for each year of the study period. Also shown in Figure 5.1 is an estimate of the change of use to offices (GFA $m^2$) over the period 1987 to 1997 (post-1997 data is not available).

The small amount of new build in 1987 and 1988 was against a background of increasing demand resulting from the expansion of Edinburgh's financial sector from 1985/86 and reflects the severe shortage of space available for development. Demand began to be satisfied by an increase in supply from 1989 (assisted by City involvement) but this

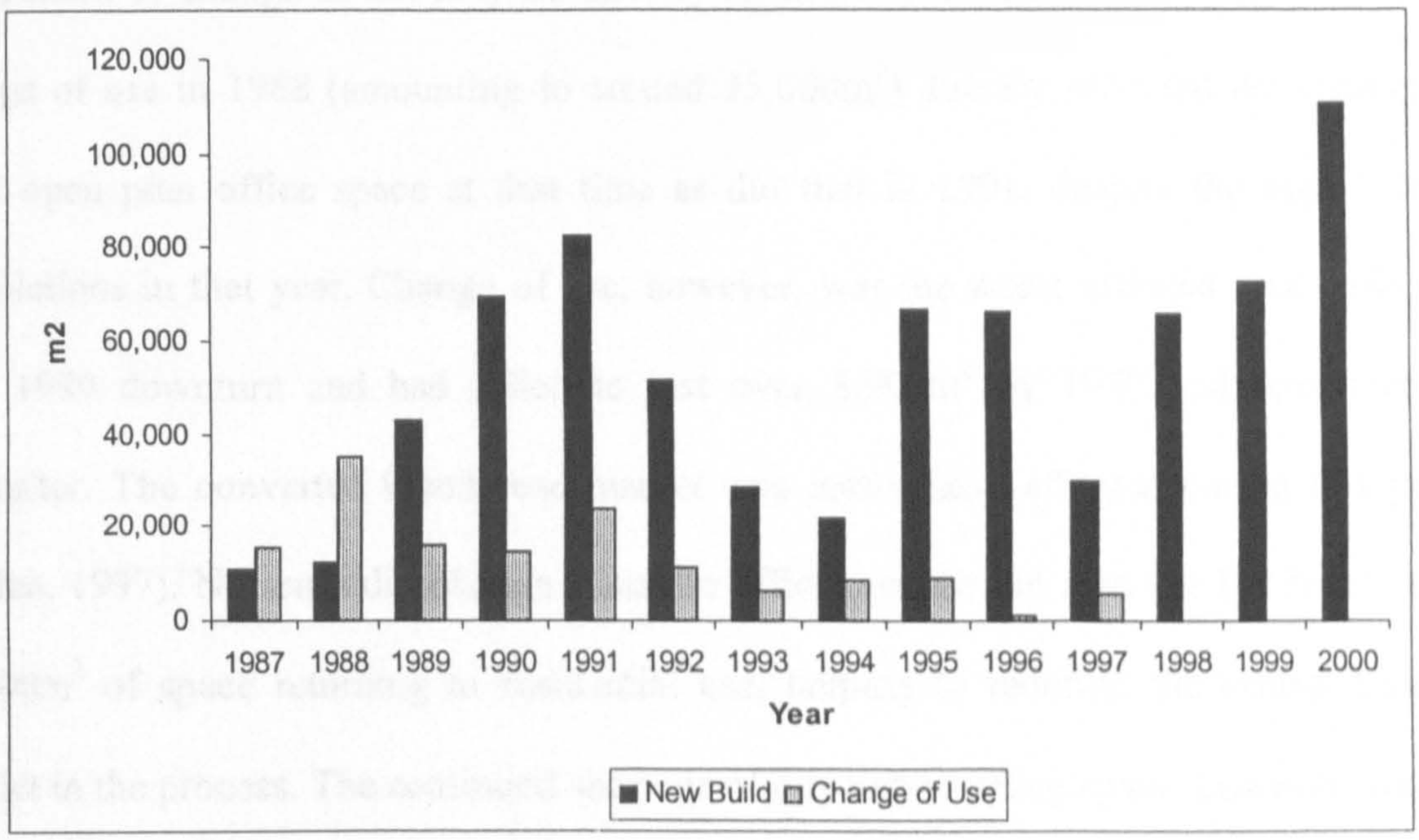


**Figure 5.1. New build and change of use**

'development boom' peaked in 1991 with the completion of around 83,000m$^2$ (893,000ft$^2$) of space. Although the general economic downturn of the early 1990s resulted in a fall in new office development, at no time was this subsequent development less than the levels exhibited in the mid-1980s. In fact, market commentaries continued to remark on the shortage of new office space (Robertson, 1991) and suggested that although Edinburgh had suffered from the economic downturn, the 'recession' in the local market was likely to be shallow. Edinburgh appeared not to be affected as badly as other local markets because there appeared to be no major oversupply problems. In fact it can be argued that trends in new build resulted as much from the continued shortage of land as the general economic conditions obtaining.

The pattern of change of use may be directly related to the trends in new build. The high change of use in 1988 (amounting to around 35,000m$^2$) directly reflected the shortage of good open plan office space at that time as did that in 1991, despite the high level of completions in that year. Change of use, however, was the worst affected area during the post 1990 downturn and had fallen to just over 8,000m$^2$ by 1993 and remained low thereafter. The converted townhouse market was particularly affected during this period (Ryden, 1997). Not only did change of use to offices reduce but also the 1990s saw some 23,000m$^2$ of space returning to residential use, helping to redefine the central business district in the process. The continued shortage of city centre office space, however, resulted in a number of major refurbishments involving the redevelopment of period buildings behind retained facades (egi Focus, 1995). In 1993 over 16,000m$^2$ of space fell into this category.

*New build by location*

The split of new space to Central, Outer and Edinburgh Park locations is given in Figure 5.2 for each year of the study. There is no real pattern in this split. However, the graph does illustrate very well the continued importance of the City centre as an office location despite the gradual development of Edinburgh Park. The high level of build in the centre in 1991 reflects the Saltire Court development (16,650m$^2$) on the edge of the Exchange District whilst the years from 1996 onwards reflect the development of the Exchange District and a series of speculative developments, particularly in 2000. It also includes major refurbishments (effectively complete rebuilds) on the edge of the Exchange District (Atholl Exchange, Caledonian Exchange) and in St Andrews Square

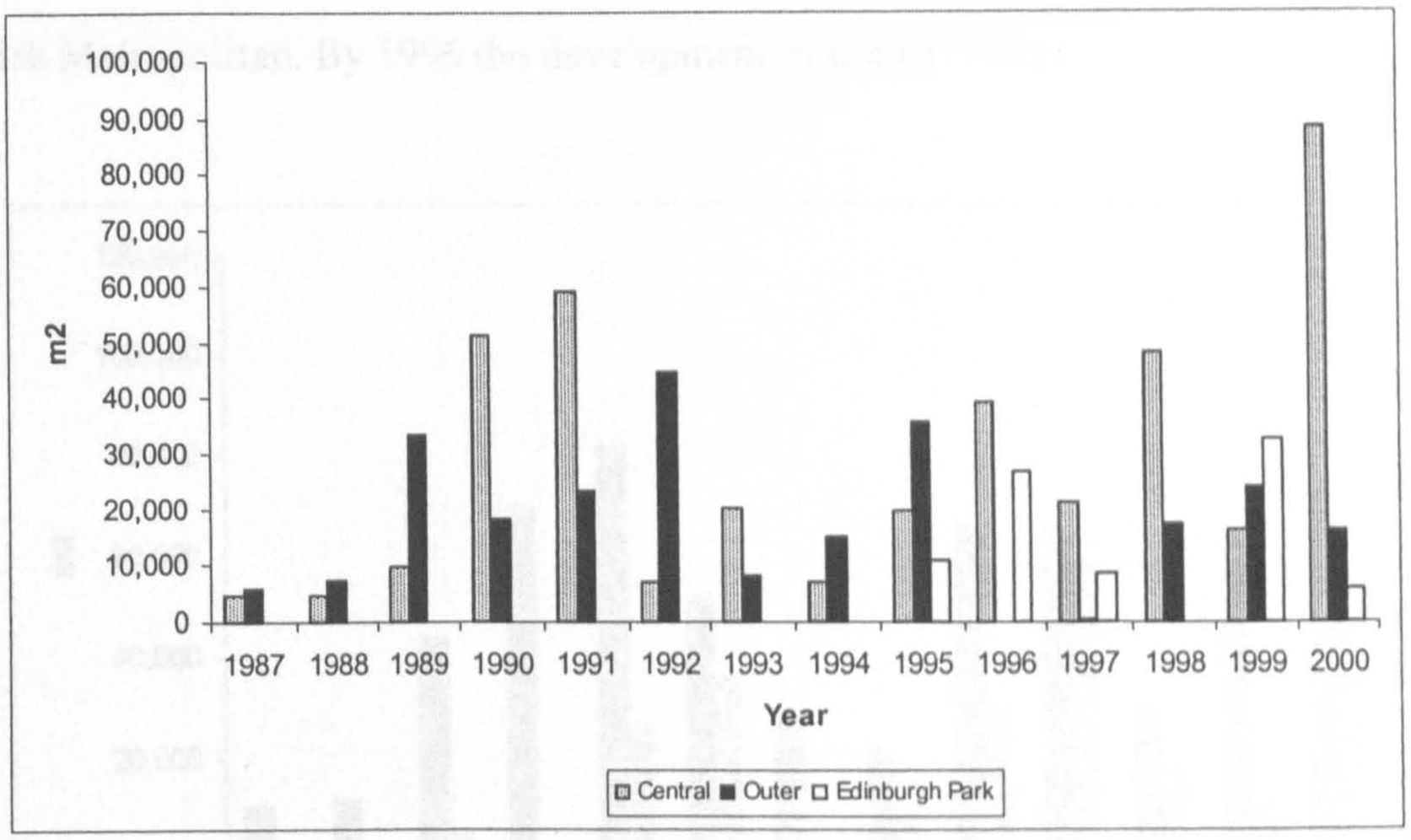


**Figure 5.2. New build by location**

The graph also shows quite clearly the increasing importance of Edinburgh Park. Over the years 1995 to 2000 the floorspace created in the Park accounted for around 21% all new build (45% of all new build in 1999) and this is set to increase in the coming years with the development of Phase 2 of the scheme.

***City involvement***

The extent of the City's involvement in new supply (excluding change of use) is outlined in Figure 5.3. The City was only judged to be 'involved' if it participated in developments either directly as lead or joint developer or indirectly through the provision of land. In fact, virtually all of the development shown as having City involvement was on land owned by the City. In the main, this was on the 144 acre Edinburgh Park site where the City had led the assembly of the site and ensured a comprehensive development policy. The gradual increase in influence from the late 1980s is apparent. By 1991 its impact on the market was

significant and included the development of Saltire Court (see above) in partnership with Scottish Metropolitan. By 1996 the development of the Exchange

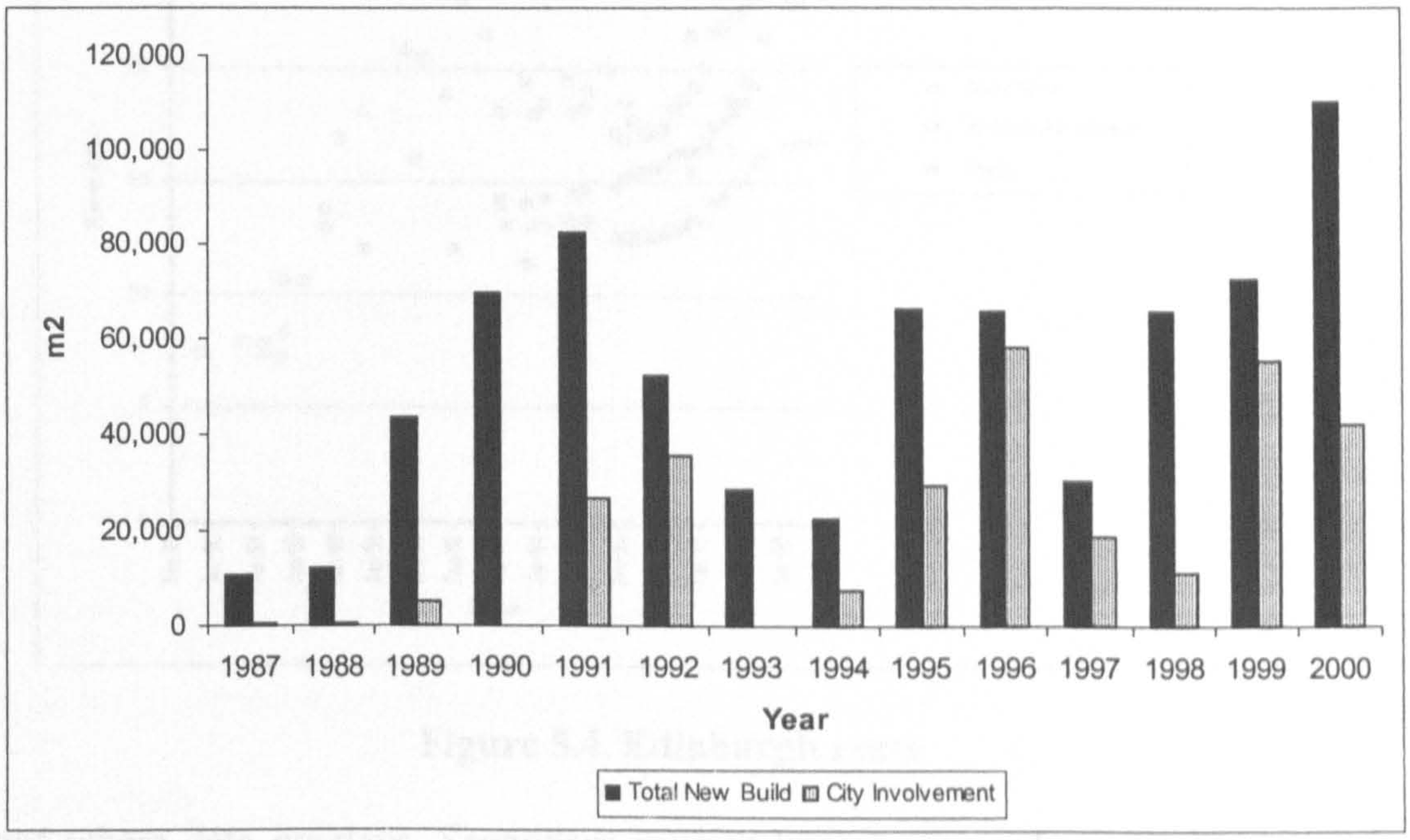


**Figure 5.3. City involvement in new development**

District becomes apparent with the inclusion of over 31,000m$^2$ of space developed on behalf of Standard Life. During the period of the study, the City of Edinburgh was involved with around 40% (excluding change of use) of all new build in the City. This tremendous input is discussed in more detail below and in Chapter 7.

**Rents**

Average rents in Edinburgh for modern, city centre open plan (prime) office space, New Town (period) office space and office space in out of town parks are summarised in Appendix 11 and Figure 5.4. The rental data is based on a number of sources (RICS periodic; Scottish Enterprise periodic; Ryden periodic and Ryden, 1993) which have been

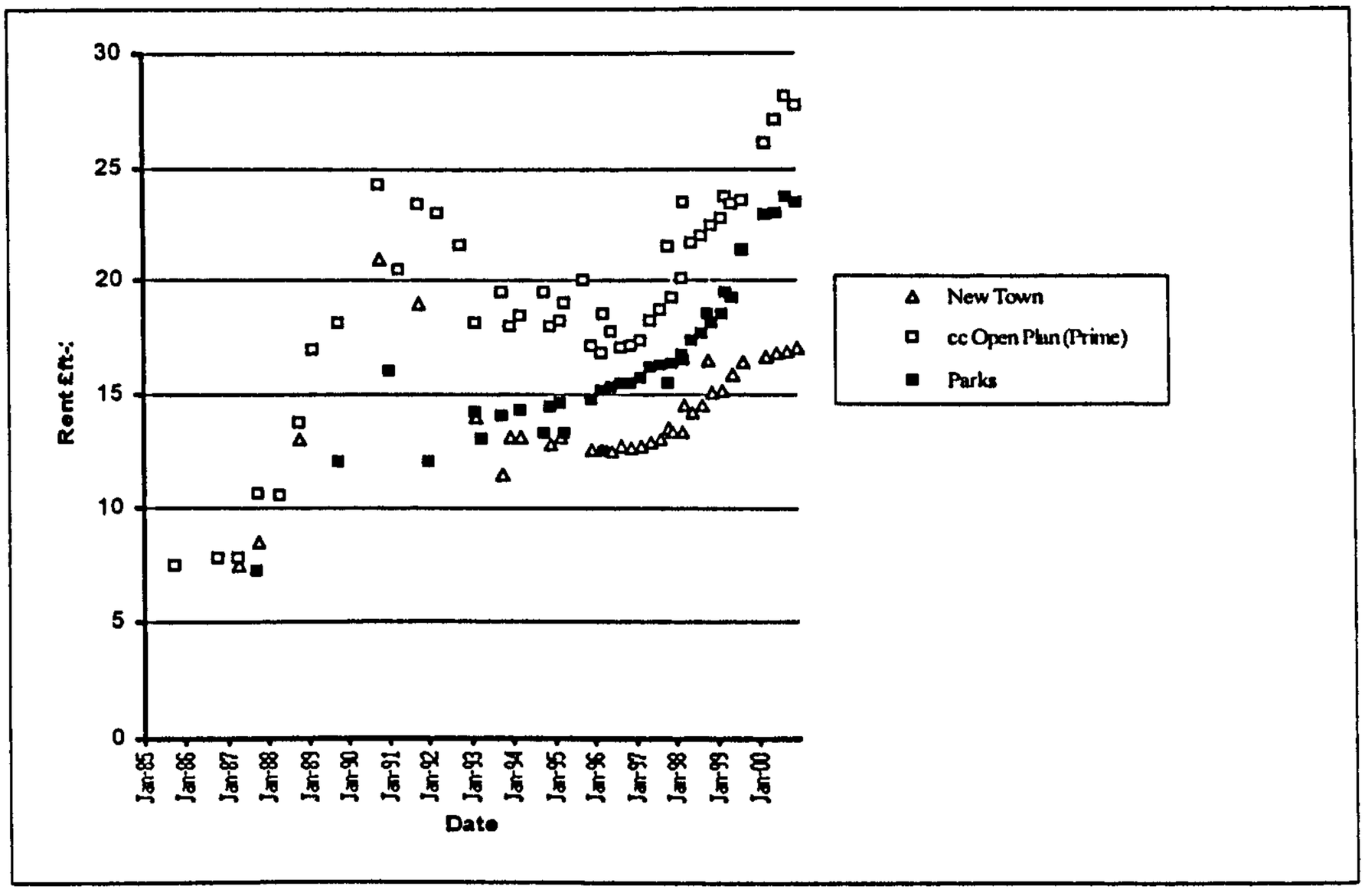


**Figure 5.4. Edinburgh rents**

averaged where data overlaps. Secondary sources have been used simply because of the sheer volume of work involved in researching original leases.

***RICS Data***

The main source of data from 1993 onwards is the RICS Scottish Commercial Property Survey. This summarises rents and yields for the major Scottish Cities, averaging data from up to 20 contributing agents for each sector, sub-market and city. The office rental data for Edinburgh is from new lets or recent rent reviews and is classified as follows:

- Modern[5] open plan office space over 20,000ft$^2$ (1,850m$^2$) in city centre or business park locations. The RICS, when collecting data, stipulate that the returns from

[5] Carpeted with raised floors.

agents should reflect open market values (headline rents adjusted) and should be net of inducements (Bruce, 2001).

- Refurbished town house offices of over 3,000ft$^2$ (280m$^2$).

***Ryden and Scottish Property Market Report data***

This data is more or less consistent with the definition of rents given for each sector by the RICS data. It reflects recent lets and rent reviews and is effectively based on open market values (actual achievable rents). Like the RICS, virtually no historical data exists on peripheral rents apart from the business park data. The information has been taken from commentaries, which are ad hoc in their reporting of rental data and, as a result, some gaps are apparent in certain years. However, the data is particularly useful for the earlier years of the present study.

***Over view of trends***

Rents showed significant growth in all three sub-markets over the period 1987 to 1990, reflecting the expansion in demand and the shortage of space for development over the period concerned. It also reflects the overall UK rental boom which started initially in London and the South East of England but took two years to spread to Scotland (Scottish Enterprise, 1992). In all cases, rents peaked around mid to late 1990, city centre open plan (prime) at around £24ft$^{-2}$, new town property at around £21ft$^{-2}$ and parks at around £16ft$^{-2}$. These peaks pre-dated the peak in new build by about a year to eighteen months. It is germane to note here that the peak rent recorded for office park rents in late 1990 is based on only one data source and it can be argued that office parks rents simply continued to rise over the whole period, albeit at a lower rate post 1990.

The post 1990 economic downturn is reflected in the rents for city centre open plan and New Town rents. The period properties in the New Town were hit hardest with rents falling by around 40% in the period to 1993 compared to a fall in open plan office rents of around 25%. In both cases, however, within error bands, rents subsequently remained fairly flat until 1997 when rents began to recover.

Whilst the economic uncertainty of the early 1990s undoubtedly impacted on rental behaviour, an additional factor may have been the interactive nature of the sub-markets. It can be argued that preferences for open plan office space in the city centre and out of town parks further depressed New Town rents. In addition, the shortage of prime space in the city centre was, almost certainly, an influencing factor on the continued strength of office park rents.

## EDINBURGH MARKET ANALYSIS

The changing role of Edinburgh's New Town and the development of new financial districts at the Exchange and the South Gyle Parks all provide continuing evidence of a dynamic interactive office market in Edinburgh. A wide range of forces is implicated in market behaviour. These include the desire to secure a particular corporate image, competitive pressures to consolidate and reduce occupation costs, location flexibility arising from advances in information technology, requirements for car parking and accessibility and Edinburgh's role as Scotland's capital city (see also LEEL and Ryden, 1997).

Within this framework, the City of Edinburgh Council played an important part in promoting new development. In this context, since the late 1980s the City of Edinburgh Council adopted a role of 'leading development' which went beyond its traditional regulatory role in the development process. This saw the Council involved in the development and regeneration of a number of key city locations in partnership with both the public and private sectors. These aspects of Council behaviour are discussed at length in Chapter 7 with particular regard to the Edinburgh Park and Exchange schemes. However, it may be noted here that to a large extent, the rationale for this approach was based on the belief that the Council had a duty to provide land for commercial development, especially since The City of Edinburgh Council was (and still is) the largest landowner in the City. Indeed, The Exchange and Edinburgh Park schemes were made possible by virtue of strategic land purchases by the City in the late 1960s early 1970s and their active interest in the land subsequently.

A feature of the policy has been the collaboration of The EDI Group (the City of Edinburgh Council's primary property development arm), the City of Edinburgh's Economic Development Group and Edinburgh International Conference Centre (EICC) Ltd[6]. The City appeared to have a vision of what it actually wanted in terms of commercial development and these departments attempted to encourage demand within the context of a balanced

[6] Set up by the City and LEEL (Lothian and Edinburgh Enterprise Ltd., the local Enterprise Company) to progress *The Exchange* scheme.

economic development strategy and assisted in the provision of land and commercial property to meet that demand.

As noted, the extent of the involvement in the commercial office market since the late 1980s has been quite remarkable. In this context, it can be argued that, given the shortage of space in Edinburgh, release by the City of the right sort of land at the right time helped to prevent the worst excesses of speculative development particularly post 1990.

The market, per se, appeared to have its greatest influence on the behaviour of the period property in the Edinburgh New Town. Here changing preferences for open plan office space impacted on change of use of period buildings to offices (the traditional source of office space in Edinburgh) and on the market in existing office space in the New Town. The wholesale restructuring of this market was moderated, however, by the availability of other space and existing leases[7].

## CLOSING REMARKS

The Chapter has demonstrated that in Edinburgh at least there is more than one local market in office space. Four markets may be identified and the Chapter has outlined the particularly interactive nature of three of these (city centre open plan, open plan offices in business parks and period properties in the Edinburgh new town). There are different rental trends in these markets, which have been affected to different extents by national economic

[7] There is a perception (Thomson, 1998) that many occupiers of New Town property would like to move to modern office space but are restricted by lease terms. If such occupiers could assign the lease or, in the case of owner/occupiers, sell on to a developer (to facilitate a move to modern office space), they would.

conditions. Indeed the data for office rents in business park locations highlights the dangers of a purely economic view of behaviour given that these rents continued to increase throughout the economic downturn of the early 1990s. Rents however, appeared to influence the provision of city centre space in the late 1980s anticipating new builds by a year to eighteen months. This link is not so apparent in the case of office parks.

The Chapter has also highlighted the importance of land and land release and it is argued that in this overall milieu trends in new build and change of use resulted as much from the trends in land supply as the general economic conditions obtaining. Firstly, the high level of change of use in the late 1980s highlights the shortage of land available for modern, open plan office space. Secondly, and perhaps more importantly, the incidence of new builds appeared to be influenced by the rolling provision of land by the City and the 'three ring circus' view of the market/development process with rent as a transmission mechanism between occupier demand and new development appeared to be misplaced. This argument is strengthened in the next two Chapters before an alternative view of behaviour in the Edinburgh market over the period of the study is proposed in Chapter 8.

## REFERENCES

Bruce, I. (2001). RICS Private Communication.

egi Focus, July 1995. *Developing the capital's assets.* Estates Gazette.

LEEL and Ryden International Property Consultants. (1997*).* *The Industrial and Business Property Markets in the Lothians*. Summary Document.

Robertson, A. (1991). *Cautious optimism in Edinburgh.* Estates Gazette Focus (egi Archive) April 1991.

Ryden International Property Consultants, periodic from 1987. Scottish Industrial and Commercial Property Review.

Ryden (1995). Scottish Property Investment Report,

RICS in Scotland, periodic from 1993. Commercial Property Survey

Scottish Enterprise and University of Paisley, periodic from 1992. Scottish Property Market Report.

Thomson, G. Ryden International Property Consultants. (1998). Private Communication.

CHAPTER 6

# Occupier behaviour in the Edinburgh office market

## INTRODUCTION

The chapter describes the results of a major survey of occupier behaviour in Edinburgh undertaken in the spring of 1999. It represents the second strand of the dynamics study of the office market in Edinburgh and examines a number of issues that affect the structure outlined in Chapter 4, such as the impact of market signals on property decisions. In particular, the survey examines:

- The extent to which occupiers prefer owner occupied compared to leasehold property and vice versa.
- Issues that affect the decision to own or rent including market price (capital or rent).
- For leaseholders, the impact of rent on the decision to lease a particular property (effectively an attempt to assess the price elasticity of demand). Also, in the context of change, diversity in the pattern of lease lengths.
- Property as a commodity. In this context, the survey examined the extent to which occupiers had an input to the design of the building they occupied; whether they were satisfied with the building they occupied and if they were dissatisfied, the reasons why they continued to occupy the building.
- In the context of overall office dynamics, likely future demands and kinetic inhibitors to movement.

Importantly, given the interactive nature of the sub-markets in Edinburgh, the survey has attempted to capture a response from the four sub-markets outlined in Chapter 5 and, where possible, the results are evaluated in terms of these markets and their impact on occupier behaviour. In addition, a start has been made in the evaluation of micro-diversity in lease patterns in the context of future structural change.

## THE OCCUPIER SURVEY

### The Survey Form and Pilot Study

The survey form used in this part of the study is shown in Appendix 12. It consisted of five main parts:

***Parts 1 and 2***

The first and second parts of the form determined some simple occupier characteristics. These included a description of the property occupied and the nature and extent of the business operations of the occupier concerned.

***Part 3***

The third part of the form examined owner and leasehold issues. In the first instance it established the extent to which property was either owner occupied or rented. Subsequently, the form examined the basis of this occupation decision and, separately, a variety of other occupation issues. There were a number of objectives. These were to:

- Establish whether price had a major impact on the decision to own or rent property.

- Establish the relative importance of the price decision compared to other factors that might influence the decision to own or rent.
- Assess the degree to which price (rent) was important in the choice of a particular property out-with the decision to own or rent. (price elasticity of demand).
- Assess the extent of micro-diversity in current and preferred lease lengths.

***Part 4***

The fourth part of the form examined aspects of the commodification of property. In particular, it examined the extent to which the occupied building was tailored to the needs of the occupier and whether the occupier was satisfied with the building it occupied. Related to this issue, an attempt was made to establish the reason for staying in the occupied building in the face of dissatisfaction with the building's performance. In systems terms, what were the kinetic inhibitors to movement? This part of the form also examined briefly likely future trends in demand in the Edinburgh office market.

***Part 5***

This part of the form examined some property management issues and the role that intermediaries played in the satisfaction of demand.

***Pilot study***

The survey form was finalised following a pilot study of five occupiers. This was carried out on a face to face basis and allowed feedback on and refinement of the questions contained in the form. No major changes were incorporated at this stage but it became clear that price was an issue for leaseholders and the first six questions in the leaseholder section were strengthened.

## Sample Frame and Sample Sizes

The survey used the 1998 Edinburgh Business Directory as the sample frame for the study. This directory contained 2,660 business addresses listed alphabetically. Since one of the aims of the survey was to capture responses from the four main office markets in the City (City centre open plan, City centre period properties, parks and industrial estates and other peripheral offices), it was necessary to stratify the sampling technique. The strata were defined as follows:

- **Stratum 1** sampled addresses in the central area[1] represented by the postal codes EH1, 2 and 3. This was used as the source of City centre open plan and period office data.
- **Stratum 2** sampled addresses in the postal code areas EH 11, 12, 13 and 14. This was used to capture office parks and industrial estates.
- **Stratum 3** consisted of all offices not sampled in the above sets. This was used to capture peripheral offices.

There were some limitations in this approach. Firstly, only office parks on the south west side of the City were captured by taking EH 11, 12, 13 and 14 postal areas. Although this choice captured the most important of the parks (including Edinburgh Park) it resulted in some bias of the results. Secondly, some knowledge of property types and addresses was required to distinguish between modern and period properties in the Central area sample.

[1] Those areas designated office core and mixed activity zones in the Edinburgh Central local plan.

All strata ignored retail property, Class 2 offices, farms, hospitals and hotels. The respective sizes of the strata before and after this filtering process are summarised in Table 2.

**Table 2. Strata Sizes**

| Stratum Number (Name) | Total Businesses (Business directory) | Total Businesses ignoring Class 2 etc | Stratum Size as % of Total Sample Frame |
|---|---|---|---|
| 1 (Central) | 905 | 719 | 27.03 |
| 2 (Outer Parks) | 446 | 100 | 3.76 |
| 3 (Peripheral) | 1309 | 1040 | 39.09 |
| Total | 2660 | 1859 | 69.88 |

The filtering process in Stratum 2 also removed businesses on the edges of the chosen postal districts but really part of the Edinburgh New Town (e.g. in EH 12, hence the need for some knowledge of properties in the various strata).

Stratum 1 was further sub-divided to capture period and modern open plan offices. Modern is defined as less than 10 years old. The sub-strata on this basis are summarised in Table 3 below. The so-called *Period* stratum on first sight appears anomalous. It is in the sense that period properties are defined as those built around two hundred years ago and some knowledge of the properties was required when making choices on which properties to include in the final survey. However, it is not so incongruous given the very small amount of post Georgian office property in the centre of Edinburgh built before 1990.

**Table 3. Stratum 1 Split by age**

| Stratum Number (Name) | Total Businesses ignoring Class 2 etc | Stratum Size as % of Total Sample Frame |
|---|---|---|
| 1a (Central – Period) | 670 | 25.2 |
| 1b (Central – Modern open plan) | 49 | 1.85 |
| Total | 719 | 27.05 |

Of the 1859 addresses remaining after the filtering process, 300 were contacted as part of the survey. This number was judged as being manageable in terms of data handling and represented a good proportion (16%) of the filtered sample frame. Because of the variation in sample stratum and because some of these were relatively small, disproportionate sampling fractions were used for the four different sample strata as follows (Table 4).

**Table 4. Sample sizes**

| Sample Stratum | Filtered stratum size | Sample size | Sample fraction size (% stratum size) |
|---|---|---|---|
| 1a (Central Period) | 670 | 107 | 16% |
| 1b (Central Mod) | 49 | 40 | 82% |
| 2 (Parks) | 100 | 40 | 40% |
| 3 (Peripheral) | 1040 | 113 | 10.8% |

The sample fraction for central properties older than 10 years was kept the same (16%) as the overall sample fraction of the filtered sample frame. Because of the small stratum size for the modern central properties a high sample size was taken. This was set at 40 being a high round number. It accounted for 82% for the central properties less than ten years old.

The same number of properties was chosen for parks. The balance of the sample was used for the remaining properties listed in the business directory.

Although these choices were somewhat arbitrary they did allow for a large sample in each category and within these strata it was possible to undertake random sampling (i.e. explicit stratification was used). The actual sampling process started with a random choice of number between one and ten. The selected sample began with the correspondingly numbered address in the business directory list relating to the sample stratum in question. This interval was repeated throughout the address list of the relevant address set until the sample stratum choice was complete.

**Survey Response**

Of the 300 survey forms distributed, 75 (25%) completed forms were returned. A further 22 forms (7.3%) were returned either not completed (16) or by the post office because the addressees were not known at the address used (6). A breakdown of these responses by stratum is given in Table 5.

**Table 5. Survey Response**

| Stratum Number (Name) | Responses | Responses as % of sample size |
|---|---|---|
| 1a Central Period | 29 | 27 |
| 1b Central Modern | 9 | 22.5 |
| 2 Outer Parks | 6 | 15 |
| 3 Peripheral | 31 | 27.4 |

Whilst overall the response rate was good, and large enough to allow some generalisations to be made on the issues covered in the questionnaire, the low numbers of responses from occupiers in parks and modern city centre open plan offices allows no more than an indication of trends in these strata. None the less, given that this is really the first survey of this kind in Edinburgh, the results serve as a useful first indication of trends.

## THE NATURE OF THE OCCUPIERS

A breakdown of the business sectors relating to those businesses that returned the survey is given below. Eight business sectors were identified. These were:

- Manufacturing (SIC A, 8%)
- Construction (SIC F, 20%)
- Wholesale and retail (SIC G, 9.3%)
- Transport storage and communication (SIC I, 2.6%)
- Financial Intermediation (SIC J – banking, insurance, pension funding and fund management, 10.6%)
- Research and Development (SIC K73, 1.3%)
- Business Services (SIC K74 – legal, accounting and other, 30.6%)
- Public Administration (SIC L, 4%)

The majority of the businesses surveyed had a turnover of less that £1M (44%) and only a relatively small proportion had a turnover of more than £100M (7%). The second largest turnover group was that in the £10 to 100M group (27%). Despite the low turnover of many of the businesses, a high proportion of them had UK and International wide operations (54%). The high incidence of service and public administration operations observed in the

survey (45.2%) reflects a feature of business in Edinburgh stretching back many years and one that has typically been contrasted with the more industrial based industries of Glasgow and Dundee (for example see Rodger, 1993).

## OCCUPATION PREFERENCES

Of the 75 occupiers who responded to the survey, 45 (60%) rented their property and 30 (40%) were owner/occupiers. The owner/occupiers included major business players in Edinburgh such as Standard Life and Adobe.

It is difficult to make too much comment on these figures in the absence of decent comparable data. However, a recent assessment of the value of commercial property in the UK (Callender and Key, 1997) suggests that the total value of property in the investment market was around 45% of the Office of National Statistics (ONS) estimate of the total value of commercial property stock at that time (1997). It is not unreasonable to assume that all of this property is let and that, therefore, the remainder (55%) is owner/occupied. In reconciling the higher proportion of rented property in the present survey compared to Callender and Key's estimate it should be noted that the ONS figure includes all commercial property. Thus it includes[2] offices, shops (including restaurants, banks, hairdressers, showrooms etc.,) warehouses and workshops, whilst the present study only includes offices. Given that offices have traditional been seen as a better investment prospect than other sectors it is perhaps not too surprising that the present study gives a higher percentage of rented accommodation and consequently a lower proportion of

[2] According to their definition.

owner/occupied property. Notwithstanding these arguments, it is remarkable that the two studies compare as well as they do in view of the crudeness of the Callender and Key study and the limited nature of the present study. This must represent an area for further work given the importance of the synergy between the two types of property rights ownership.

A breakdown of this ownership pattern by stratum is even more interesting (Table 6).

**Table 6. Occupation preference by market area**

| Stratum | Owner occupation (%) | Leaseholders (%) |
|---|---|---|
| Central – Period | 48 | 52 |
| Central – Modern | 11 | 89 |
| Parks | 33 | 67 |
| Peripheral | 40 | 60 |

Given that by definition the central properties (modern) are less than ten years old and that the park properties of the same age, in general, the data suggests a progressive move to lease hold occupation with the more modern property. Both of these strata have a higher than average incidence of leasehold occupation.

## THE OCCUPATION DECISION

The decision to buy rather than rent (and vice versa) is important in a systems sense in as much as it really defines the link between the system in which ownership is separated from occupation and the owner/occupier system. The present section examines this decision on three levels. Firstly it examines those factors (including price) impacting on the decision

that were common to both owner-occupiers and leaseholders and whether their responses relate to the type of occupier. Secondly, the impact of the cost (price) of the alternative option on the decision is examined and finally leaseholder attitudes are examined for a few other factors.

**Common Factors Impacting on the Decision**

It became immediately apparent that the majority of occupiers had on-going policies (and presumably on-going preferences) for either owner-occupation or renting within their organisation (77% of owner-occupiers and 67% of leaseholders had positive policies in this regard). It has not been straightforward unravelling the basis of these policies, however, since the responses in the survey are not particularly clear. The responses to the common factors[3] impacting on the decision are summarised in Figure 6.1 for both renters and owners. Clearly all of these factors were of some importance to some of the occupiers, whether renters or owners, but there does not appear to be any particular pattern to these results. Remarkably, perhaps, the cost (price) of the type of property of their choice had no major impact on the decision (only 36% of owner occupiers and 38% of leaseholders indicated that price affected their decision to own or rent).

Although there appeared to be a slight difference in the responses of renters and buyers a $\chi^2$ test[4] indicated that this was not significant (i.e. there was no pattern to the responses of owner occupiers compared to renters) apart from on going cost. In this case renters were

[3] The price of their preferred choice, availability, location, financial (the impact of a capital asset on the business), risk, mobility, potential lease terms and on going cost.

[4] At the 0.1 probability level.

more concerned with on going cost than buyers but overall the majority of occupiers (68%) did not see this as a factor in their choice.

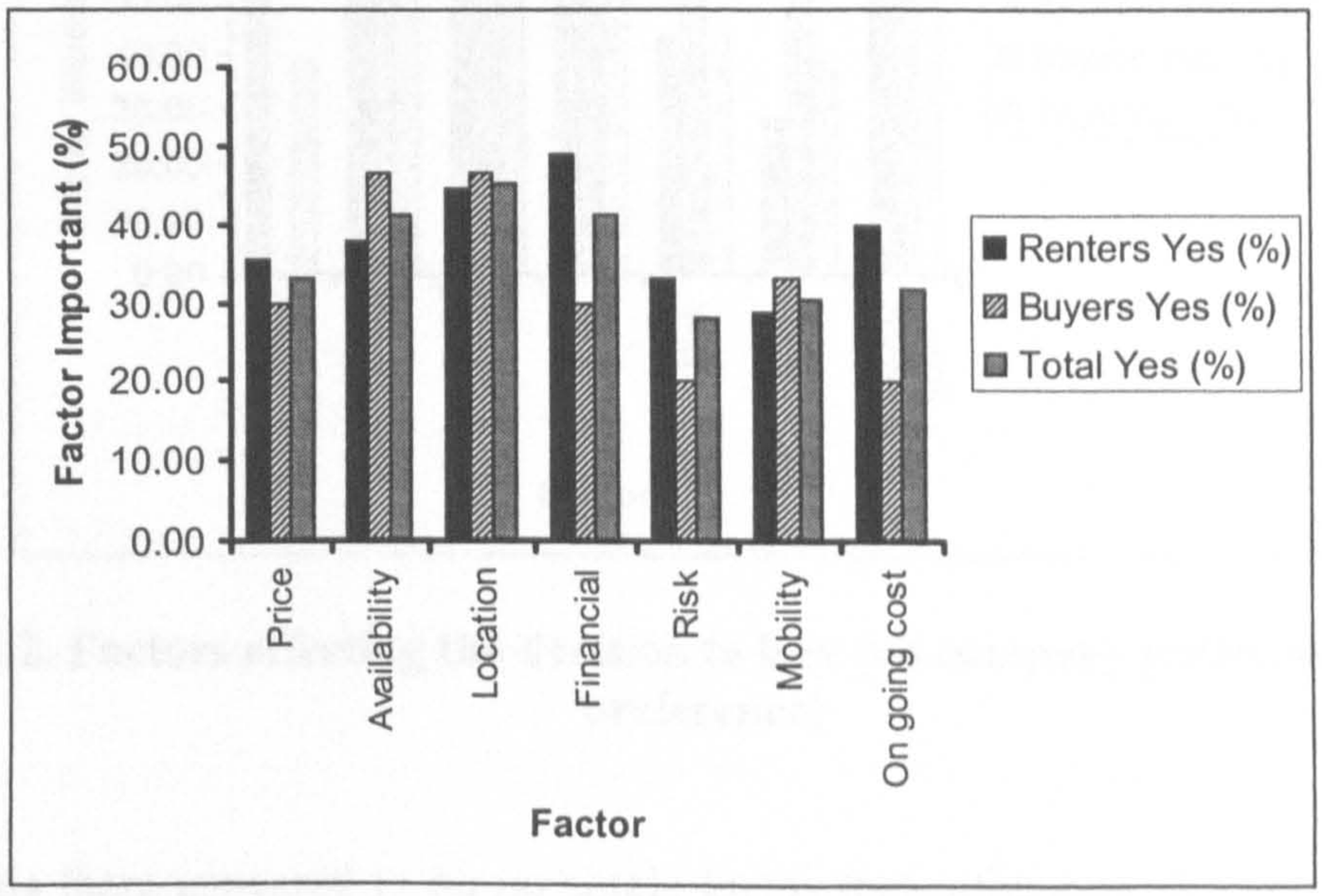


**Figure 6.1. Factors affecting the decision to buy (all respondents)**

This pattern hardly changes when the responses from only those occupiers with on-going occupation policies are considered (perhaps not that surprising given the high numbers of occupiers in this category). However, there was a clear difference in the responses of those who did not have an on-going policy for occupation (Figure 6.2). To some extent the owner occupier responses are skewed by the much lower numbers in this category and the response on mobility ought to be treated with some circumspection. However, the remainder of the results show availability and location as being important in the decision process for both sets of occupiers although $\chi^2$ tests suggest no different patterns of responses between them. There is a significant difference in response, however, in the case of price (cost). In this case renters appeared to be far more influenced by this factor than owner-occupiers are.

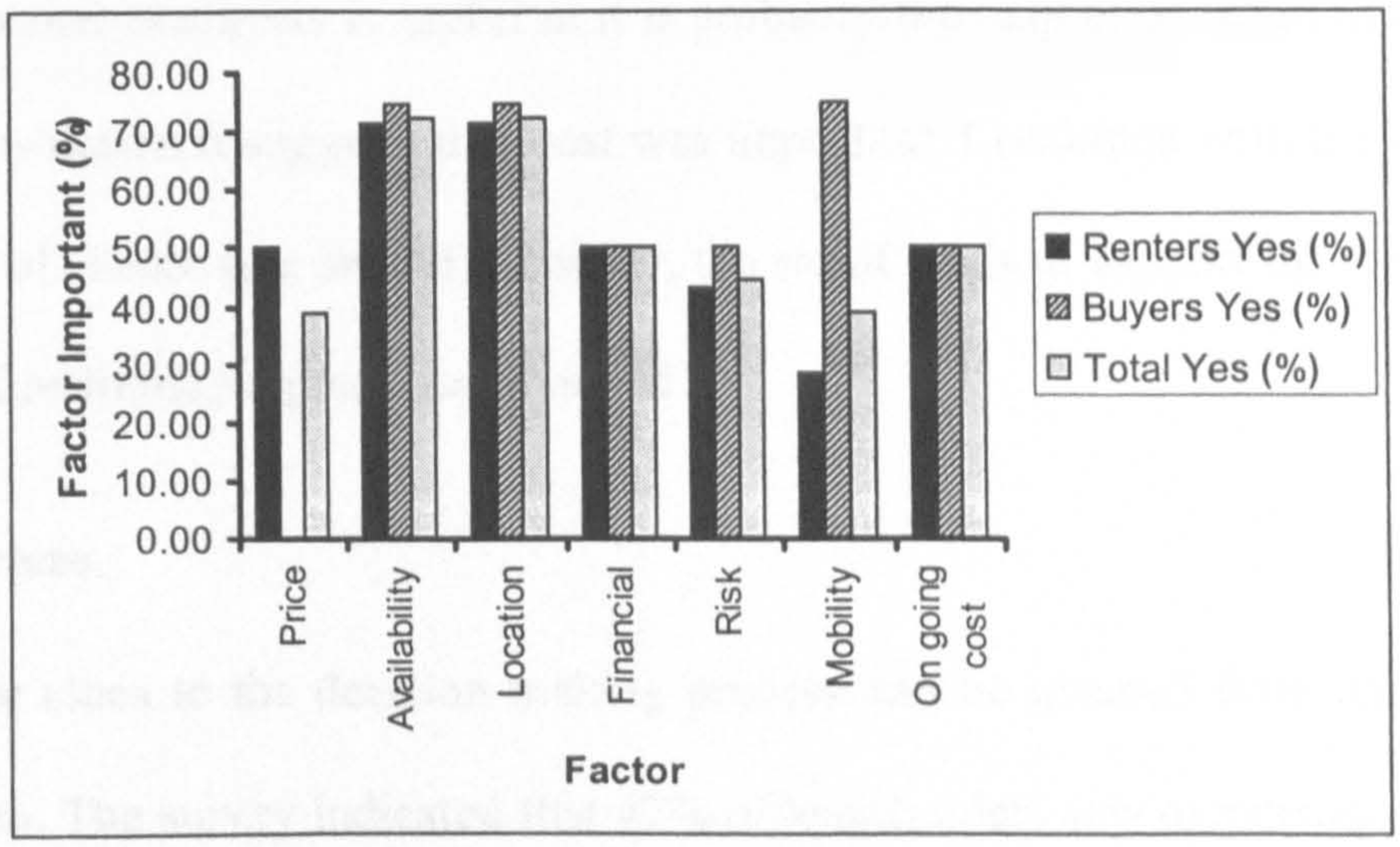


**Figure 6.2. Factors affecting the decision to buy (no company policy on occupation preference)**

In all of this there appeared to be no single factor that influenced the decision to own or rent. Rather, there appeared to be an almost institutional prejudice to either leasehold or owner occupation in the great majority of cases, and this was reflected in the 'flat' response to the questionnaire. It was also reflected in the perception of 93% of owner/occupiers that property was an asset rather than a cost and in 66% of leaseholders that property was a cost rather than an asset.

**The Impact of the Cost of the Alternative on the Decision**

If the cost of the property type of their choice had no impact on the decision did institutional prejudice stretch to the cost of the alternative. Were any comparisons made? Owner-occupiers were asked whether market rental values influenced the decision to own or rent. Of the 27 (90%) respondents, 58% suggested that the cost of the alternative (renting) had affected their decision. It was a fault of the survey form, not picked up in the pilot, that the same simple direct question was not asked of leaseholders. However, the

result for owner-occupiers is useful in it is probably the only clear result in this part of the survey. In isolation it suggests that cost was important. Combined with the lack of interest in the cost of choice (see above), however, the result tends to support the view that there is a degree of institutional prejudice involved.

### Other Factors

Some other clues to the decision making process can be gleaned from other parts of the survey form. The survey indicated that 47% of leaseholders saw ownership as unattractive, although when prompted to explain why only a small fraction (less than 10%) responded. Those that did answer the question indicated a fear of long term commitment with impacts on mobility and this may indicate the root of the prejudice for leaseholders at least. The opportunity to bespoke build and the attraction of stability in terms of better prediction of on going costs and susceptibility to changes in rental value was attractive to a significant (40%) proportion of lease holders.

## PRICE ELASTICITY OF DEMAND

### The Impact of Price on Choice of Property

Separate from the decision to own or rent is the impact of price and other factors on the decision to purchase or rent a particular building. There is a widespread perception that for most property, demand appears to be relatively price inelastic due to (mainly) the lack of substitutability and to the fact that for most tenants rent tends to be a relatively small proportion of total costs (for example see Fraser, 1993, p188). There is little hard evidence, however, to support this view and the survey attempts to at least give an indication of its validity. In this context, whereas the survey cannot (and does not) attempt a full-blown

analysis of the price elasticity of demand, it attempts to give an indication of the impact of price on decisions.

The survey indicated that that the majority of respondents considered price in their decision to acquire their current property to some extent (nearly 75% of owner-occupiers and nearly 74% of renters). Only 15% of owner-occupiers and 20% of renters indicated that they were not affected at all by price. Although price does not appear to drive the decision to own or rent, it does seem to impact heavily on individual buying decisions.

For those lease holders that were affected by price, it is possible to make a crude estimate of the elasticity of demand from the survey results[5]. Figure 6.3 shows the responses of this group to the question 'What is the maximum increase in rent you would be prepared to pay to stay in the present property?

The results clearly show the importance of price to this group of users and suggest that demand is much more price elastic than is commonly believed. There is a dramatic fall in 'demand' for increases in rent of between 20 and 30%.

Price also appears to be important across the strata (Figure 6.4) albeit less so for occupiers in Park locations.

[5] But not for owner-occupiers unfortunately - like the analysis of the cost of alternatives, it was a fault of the survey form that the same simple questions were not asked for this group.

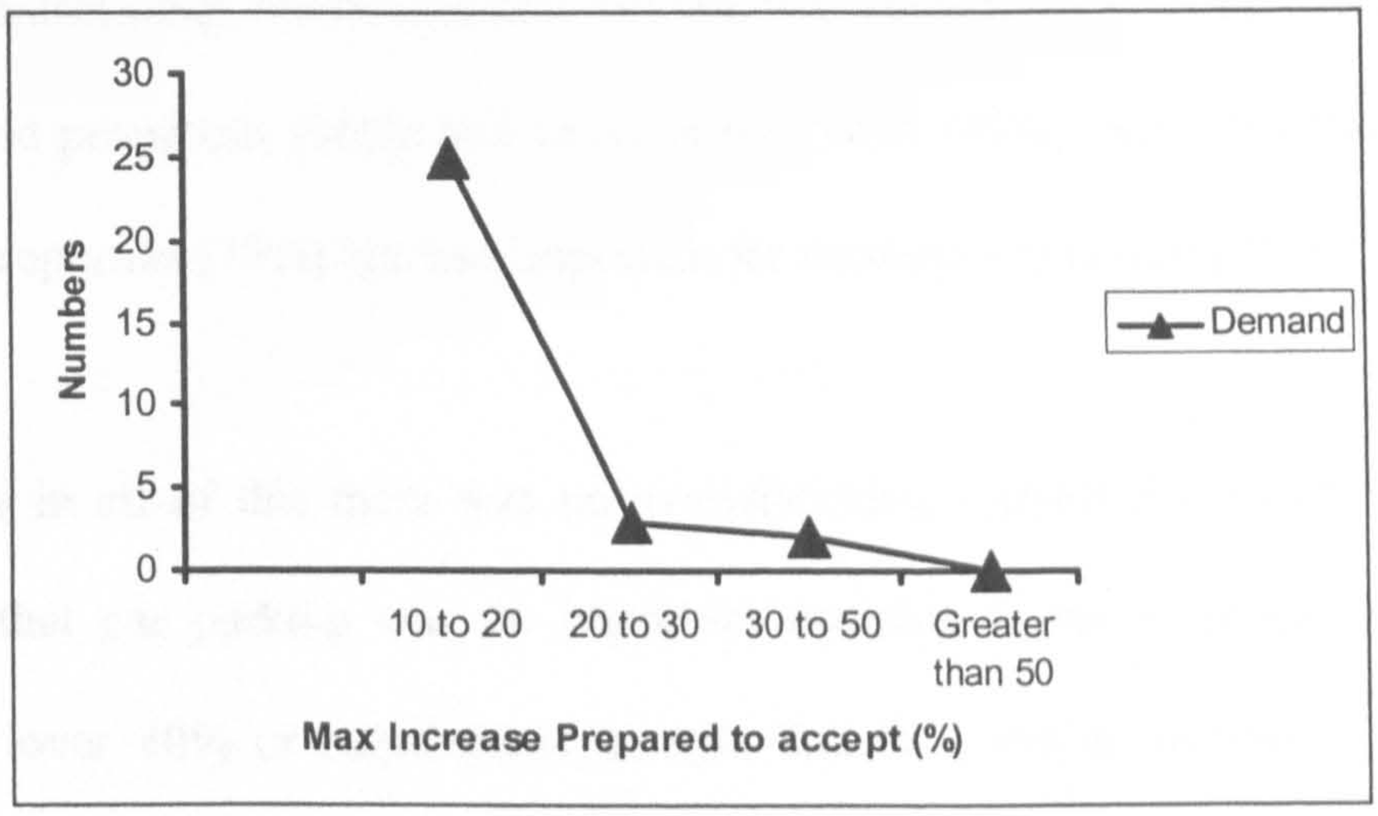


**Figure 6.3. 'Demand elasticity'.**

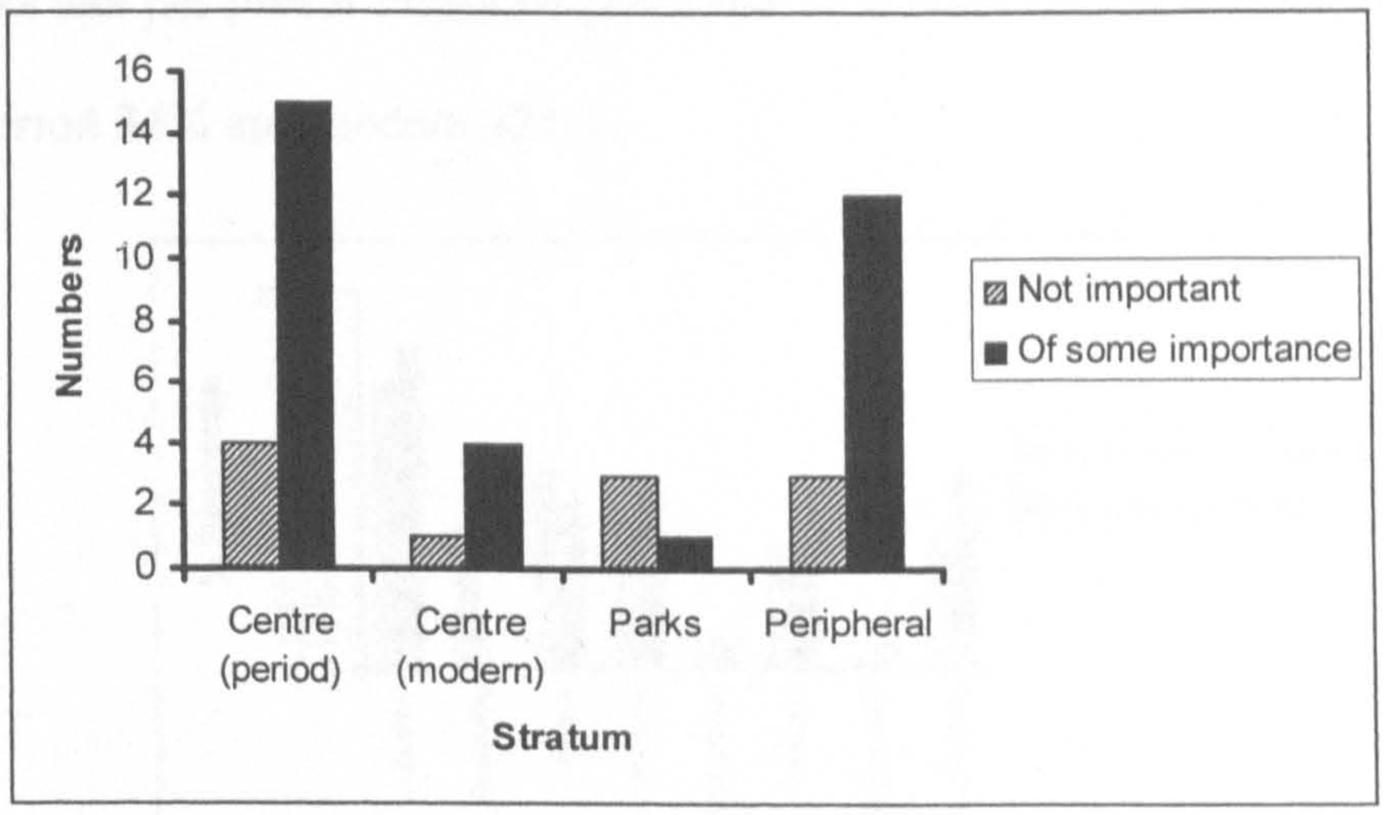


**Figure 6.4. The impact of price across the strata**

## OTHER FACTORS INFLUENCING THE CHOICE OF PROPERTY

The survey examined the impact of a range of other factors on the choice of property. For both occupier groups the factors included location, availability of the right building, quality, flexible workspace, the availability of a skilled labour force locally, public transport, facilities management and car parking. Of the common factors impacting on choice (Figure 6.5), location was by far the most important consideration (77% of owner occupiers and 87% of lease holders). A breakdown of this response by stratum is

particularly interesting. It indicates that location was considered to be particularly important for the period properties (96%) and those in the parks (99%), still important for those in peripheral properties (77%) but less important for modern city centre properties (44%).

Interestingly in all of this there was no overwhelming support for anecdotal evidence in Edinburgh that car parking was an important decision factor in property choice. Thus overall just over 40% or respondents thought that this was an important factor in their choice of building. However, a breakdown by stratum suggests that it is more important for those in parks and peripheral locations (84% and 52% respectively compared to city centre locations (period 34% and modern 22%).

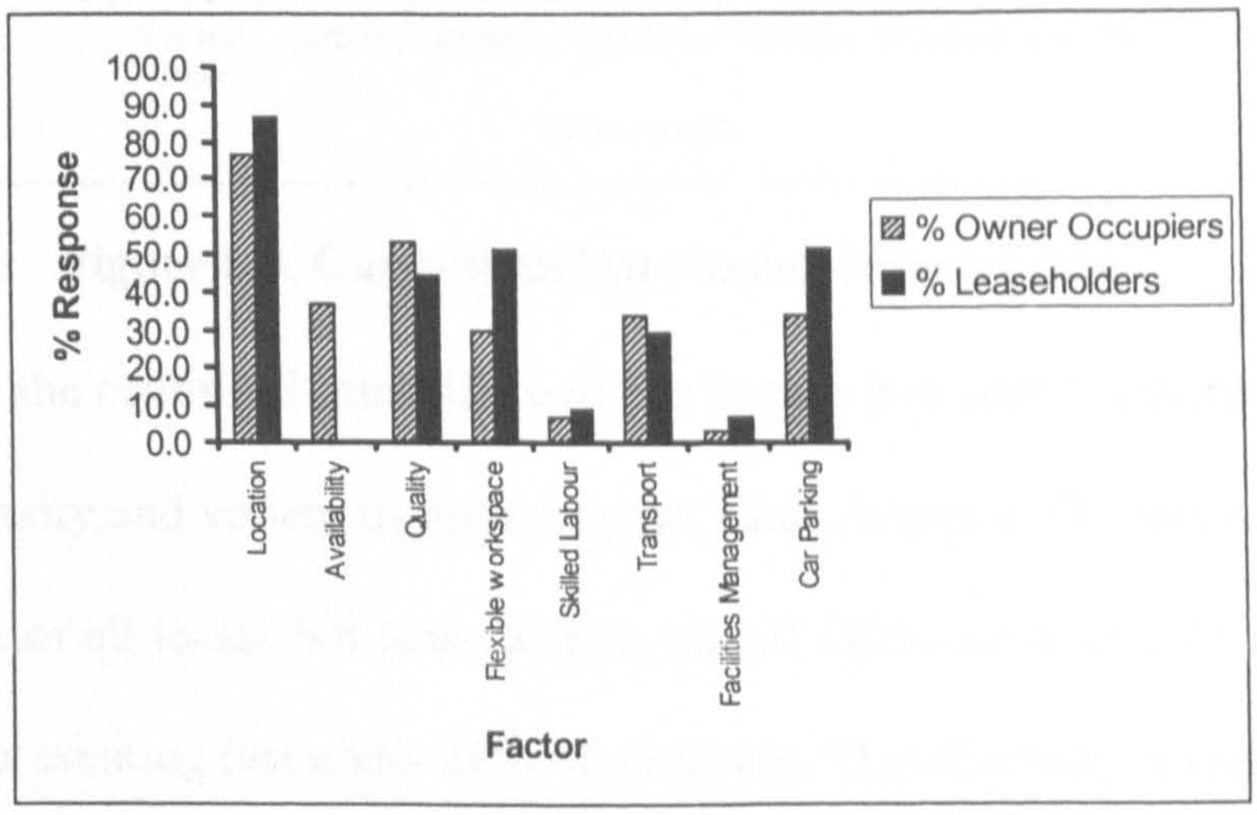


**Figure 6.5. Other factors influencing the decision to acquire the present property.**

**MICRO-DIVERSITY IN LEASE LENGTHS**

Because the survey was mainly concerned with analysing existing structural links in the property market (particularly that relating to price) there was little opportunity to examine change. One area of change that was examined, however, was that relating to lease length. It examined this on two levels. In terms of past change the survey examined how lease

lengths had changed over the period of the study. In terms of future change the survey examined preferred lease lengths compared to current lease lengths.

The distribution of current lease lengths is given in Figure 6.6, which also shows the preferred lease length of respondents.

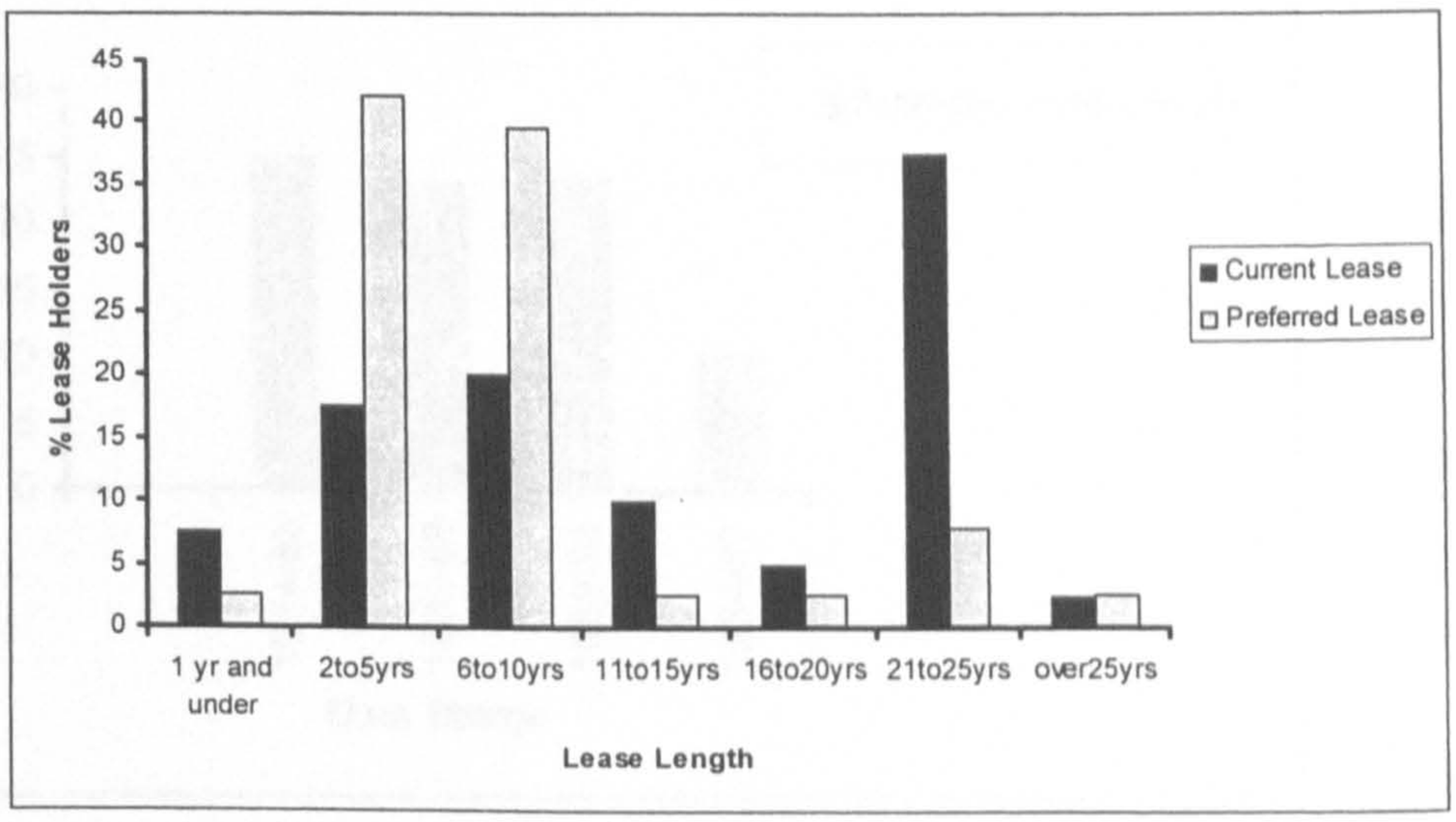


**Figure 6.6. Current and preferred lease lengths**

The results reflect the continued importance of the twenty-five year "institutional lease" but also reflect a diversity and variety in lease lengths. Thus, leases in the range 21 to 25 years constituted 37.5% of all leases but lease lengths varied from one to twenty-five years with ten year leases representing just under 20% of all leases. This diversity is entirely consistent with the results of a recent RICS study of the impact of changing business patterns on the property market (Lizieri, C. et al, 1997), which detected a similar pattern.

In comparison, the preferred lease length of users was overwhelmingly in the range 2 to 10 years (with 42% in the range 2 to 5 years and 39.5% in the range 6 to 10 years).

Although users are restricted by their current leases in moving to shorter lease lengths (see below kinetic inhibitors to movement) there has been a clear shortening of commercial lease lengths over the last five or so years. The results have been analysed in terms of lease length by the lease start date in Figure 6.7.

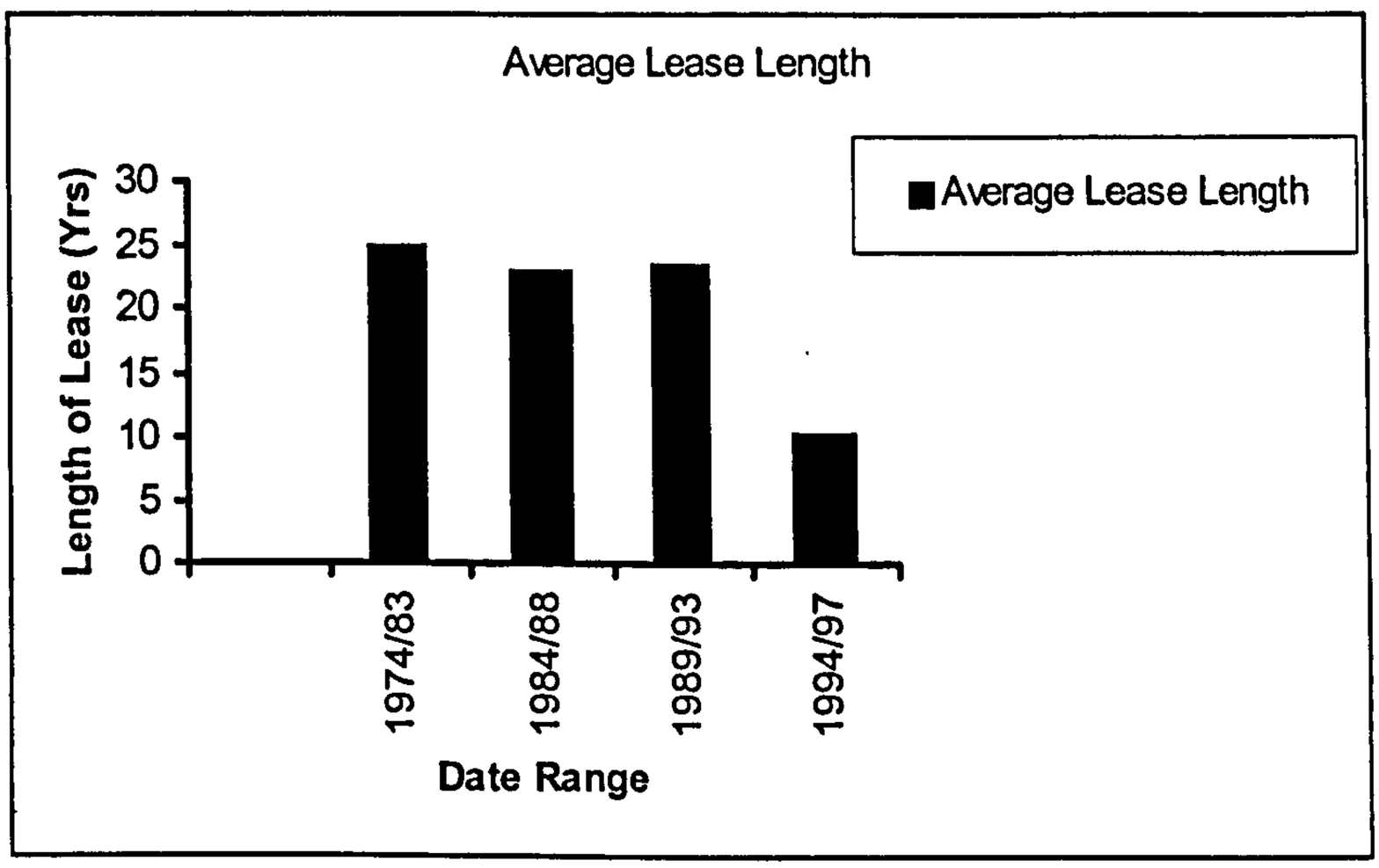


**Figure 6.7. Average length of lease by date of commencement**

This analysis is also consistent with the study of Lizieri et al (1997), which confirmed that across the 1990s commercial lease lengths shortened. In the case of offices, they suggested that smaller, secondary, properties had shorter leases in general and weighting all results for this phenomenon, average lease lengths fell from over 30 years in 1970 to 12.2 years in 1995. By far the biggest change occurred from 1990 to 1995 when average lease lengths fell from 23.5 years to 12.2 years (compare the present study where average lease lengths fell from 23.5 years in the date range 1989 to 1993 to 10.26 years in the date range 1994 to 1997). These are important results in terms of behaviour and their potential impact on structure changes and as such are discussed in more detail below in the overall context of the systems implications of the survey results.

## PROPERTY AS A COMMODITY

In a predominately investment market in which 60% of property is rented from property companies, institutions and the like, one might expect a 'levelling down' of property design/development that is more geared to investment value and not to use value and the convenience of the user. In this scheme of things, office property is developed as a commodity to buy and sell to the benefit of the investors and developers and the user takes second place. However, buildings still have to be built to satisfy users if floor space is to be let and the survey has attempted to assess the degree to which this is true. Are users happy with their buildings? Is there any evidence that the commodification of property has occurred to the extent that investment preferences outweigh user requirements? Is it only owner/occupiers who have a say in the design and layout of their buildings?

The assessment very much concentrates on the user. It is limited in this regard as time limitations have precluded assessments of investor and developer behaviour. All users were included, resulting in a good population with which to assess the data.

### Degree of dissatisfaction with buildings

Despite the temptation to believe that the nature of the investment and development markets might lead to a significant degree of dissatisfaction with the buildings users occupy the evidence is to the contrary. The survey results suggested that less than a third (32%) of all users (owner occupiers and lease holders) were dissatisfied with the buildings they occupy. This does not mean of course that user are, per se, satisfied with the buildings they occupy but it does indicate that the developers are getting something right. The result is remarkable given that less than half (41%) of all occupiers surveyed actually had an input

to the design/layout of the building they occupied. Surprisingly, owner/occupiers (43%) and leaseholders (40%) had an almost equal input into the building they occupied. Perhaps not surprisingly, of those users who were dissatisfied with their buildings, only 33% had an input to the design and/or internal layout of the building.

## Reasons for Dissatisfaction with Buildings

The reasons for dissatisfaction were various. An analysis of these is given in Figure 6.8.

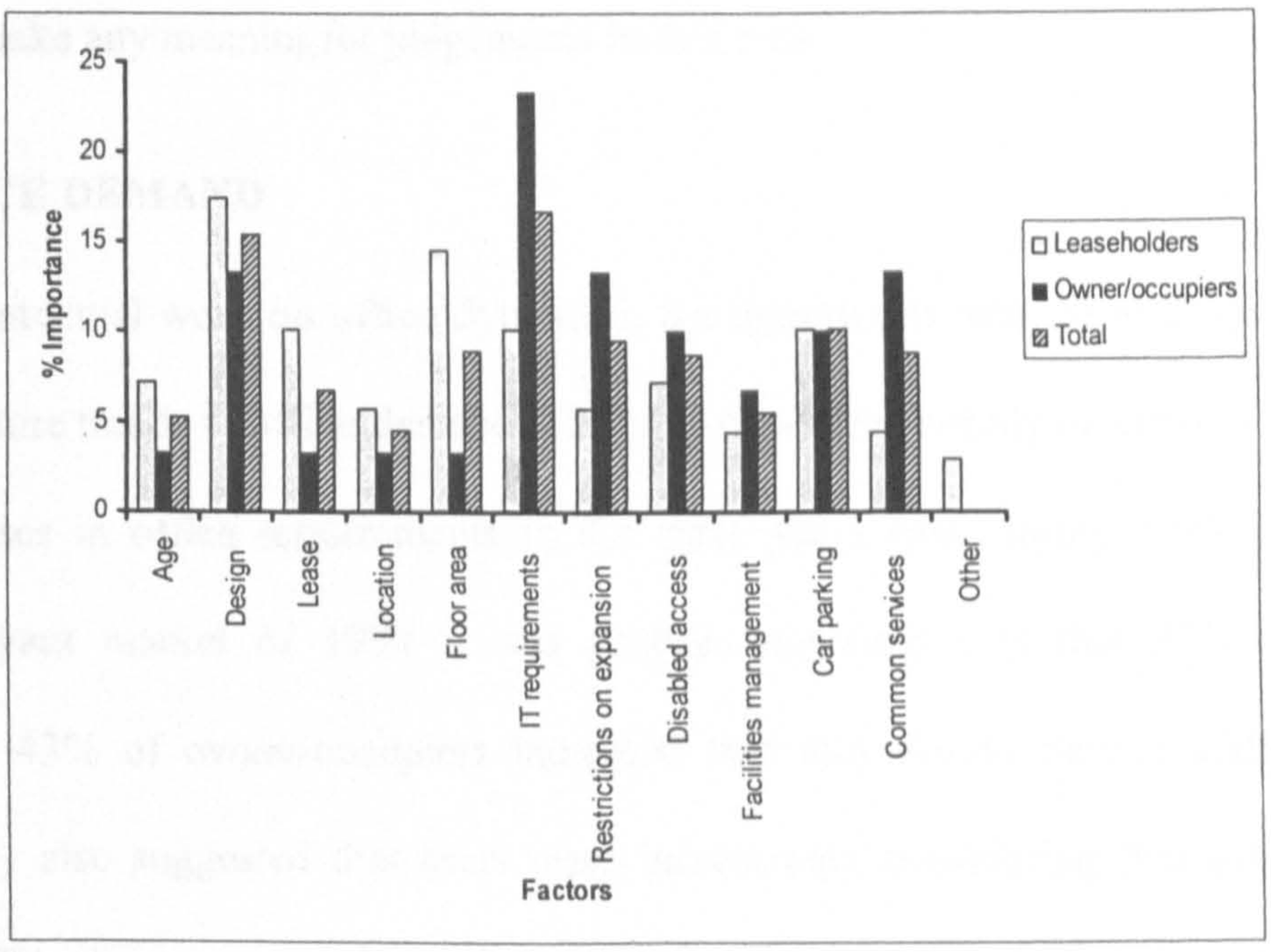


**Figure 6.8 Reasons for dissatisfaction with building occupied**

There were many areas of dissatisfaction but the two main areas were the layout of the building failing to accommodate modern IT requirements and the general design/layout of the building. One incongruous result was the dissatisfaction with lease terms from owner/occupiers! The areas of dissatisfaction are not that surprising when it is remembered that of the buildings sampled 60% were over 50 years old, but the results do indicate the continuing requirements for buildings to accommodate IT systems. Leaseholders, who

generally occupied more modern buildings, had less of a problem with these areas than owner/occupiers. Once again, car parking was not a particular issue.

### Inhibitors to Movement

Despite these areas of dissatisfaction, users are restricted in their flexibility to move for a variety of reasons. In the case of leaseholders, 40% of users were restricted by lease term and a further 23% by the availability of suitable stock. Responses from owner/occupiers were too low to make any meaningful judgements in this area.

## FUTURE OFFICE DEMAND

As part of the contextual work on office dynamics, the opportunity was taken to question users on likely future trends in office demand. This was conducted simply in terms of likely increases/ decreases in office requirements in the three years from spring 1999. In the increasingly buoyant market of 1999 it was perhaps not surprising that 35% of all leaseholders and 43% of owner/occupiers indicated that they would require additional space. The survey also suggested that users were increasingly considering 'hot desking'. Although only 17% of users currently used the technique, over 48% of all users indicated that they would consider using it in the next five years.

## PROPERTY MANAGEMENT AND USE OF INTERMEDIARIES

It is remarkable that the users who responded to the survey had the views they did on property and the place of property in their organisation given that only around 30% of them actually had a strategy for property operations. It was mostly companies with in house property teams that had strategies for their property holdings although this was not as great as would be expected (60% of companies with in house property teams had well defined

strategies). For many their strategic approach to property was simply one of supporting business operations[6]. When making property decisions, the largest group of occupiers (50%) obtained property information from agents to help make their decisions. This information was supplemented by in-house property teams (34%), word of mouth (35%) and the property press (34%). Agents were also used as the main source of advice and help when actually moving property (by 41% of respondents).

## CONCLUDING REMARKS

The survey set out to examine, primarily, a number of structural issues affecting the systems structure diagram outlined in Chapter 4. It has, however, gone beyond structural issues and has examined aspects of occupier behaviour in the Edinburgh office market not previously examined in such depth. There is no way of telling in absolute terms the extent to which the results are applicable to other markets. However, there is good supporting evidence, particularly in the case of lease lengths, that they may have wide application, given that the results reflect quite closely the independent work of Lizieri et al (1997).

The response to the survey was large enough to allow generalizations to be made on a number of issues across the four main types of offices examined in Edinburgh (modern city centre open plan, office parks, period property and peripheral offices). The low numbers of responses from occupiers in parks and modern city centre offices, however, limited the ability to compare responses across the four types and allowed no more than an indication of trends in these two particular groups. Nonetheless, given that the survey was the most

[6] Only 5% considered property cost minimisation or revenue maximisation in relation to property management.

detailed of its kind undertaken in Edinburgh to date, the results serve as a useful first indication of trends.

**Owner occupation and leasehold occupation**

In general terms the study forces recognition of the high proportion of owner occupation in office accommodation in Edinburgh and represents only one of two such studies of the relationship between owner occupation and leasehold occupation. It is easy to be lulled into a sense of a much higher proportion of rented accommodation in view of the importance of this type of occupation to the investment market. Whilst the evidence from the survey is that the preference for rented accommodation is increasing, owner occupation represents a significant proportion of occupied property (40%) and more detailed studies are required of its relationship to lease hold property. Whilst the study failed to properly uncover the reasons why such a high proportion of businesses had an in built preference for one or other of the types of occupation it was clear that price affected the decision to some degree or another (structural considerations in this regard are considered below because the response to price was complex and on a number of levels). For leaseholders a fear of a long-term commitment with impacts on mobility was also important in the decision. The availability of the right sort of building and location affected the decision of both leaseholders and owner/occupiers although the analysis was not clear-cut[7]. For leaseholders the opportunity to bespoke build made owner/occupation an attractive alternative.

[7] Only those occupiers without on-going policies with regard to occupation preference clearly indicated availability and location as being important in the decision. For the remainder these factors rated at about the same importance as other factors.

The results tend to support the conclusions of a recent survey of Edinburgh and Glasgow users (Estates Gazette, 1998)[8]. This suggests that if occupiers cannot find good quality space at the right price, more may go down the route of owner/occupation despite any preconceived ideas on the nature of their occupation. Some argue that owner/occupation actually allows a better degree of flexibility, despite the long term commitment perceived by leaseholders as unfavourable, since the building can be sold or leased if necessary.

**The Impact of Price**

The impact of price on property decisions has been addressed on two levels. These are:

- Its impact on the decision to own or rent (see above).
- Its impact on the decision to own or rent a particular building.

The survey suggests that price does not drive the decision to own or rent but it does impact heavily on individual buying decisions. Thus once the decision to own or rent has been made, either capital price, in the case of owner/occupiers, or rents, in the case of leaseholders, affect the choice and demand for a particular building. Both of these aspects impact on the overall demand for property and the demand for property at a particular price (measured by the price elasticity of demand). Although the survey did not attempt a full-blown analysis of price elasticity it was clear from the results that property was much more price elastic than heretofore thought. Fraser (1993, p187) notes that the critical importance of location to property is a fundamental reason for the perception that property in general

[8] Although not as clear cut.

has a very inelastic demand. He also notes that the view tends to be taken that since elasticity of demand depends on its cost as a proportion of total factor costs and since for most occupiers rent is a small percentage of total costs, occupation demand is therefore relatively inelastic. The results here do not bear out these assumptions. Certainly, for rented accommodation, the choice of accommodation appeared to be extremely sensitive to price. However, the survey does support the view (for owner-occupiers) that the cost of the alternative choice of occupation type (i.e. lease hold) will tend to affect the demand for rented accommodation. The converse view was not tested.

In structural terms the results confirm the negative feedback loop from rent to demand incorporated in the structure diagram in Chapter 4 but it is still questionable whether the link to vacancy rate should be through take up rate or direct from demand. What is clear, however, is that some allowance ought to be incorporated into the structure for the competitive links to owner/occupation and leasehold occupation. This might be represented as in Figure 6.9, which also incorporates other factors impacting on the decision to own or rent.

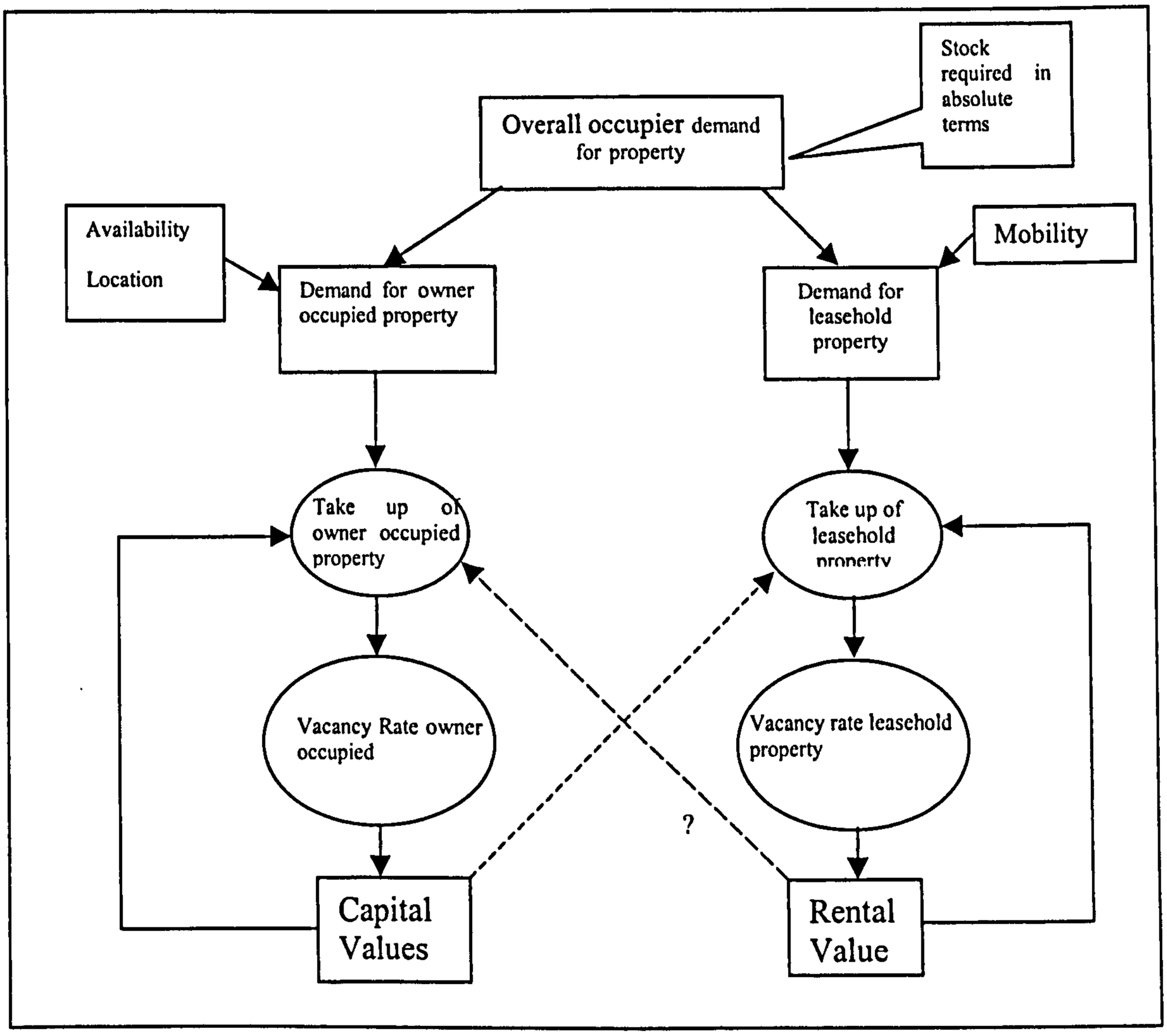


**Figure 6.9. Price links**

Clearly there is a need for a better understanding of these complex links, which cannot and should not be divorced from the structural relationships and behaviour in the leasehold market outlined in previous chapters.

**Lease Lengths**

As noted previously, the data on lease lengths is entirely consistent with the study of Lizieri et al (1997), which confirmed that across the 1990s commercial lease lengths shortened.

The results in the present work also confirm the diversity in lease lengths across all markets in Edinburgh.

The downward trend in lease lengths is really a post war phenomenon which settled out in the mid 1970s to the 25 year lease with five year rent reviews that became known as the standard institutional lease. This lease form persisted across the 1970s and 1980s with little variation (Lizieri et al, 1997). In rationalising the dramatic shortening of lease lengths observed in their analysis, these authors note that in the aftermath of the property slump at the end of the 1980s/early 1990s[9] the standard institutional lease was subject to much criticism. It was seen as unfair and onerous on tenants and inflexible in operation. Over the same period lease lengths fell and tenant incentives increased sharply (notably the concession of break clauses and substantial rent free periods). Against this background Lizieri et al offer two explanations:

- The shortening of leases is a function of supply and demand in the market place. Over supply and high vacancy rates present tenants with a strong negotiating position which they exploit to gain better terms. When supply and demand are more balanced, the operation of the market gives landlords an advantage (and by implication leases lengthen). They go on to note that since the long lease encourages investment and ensures a supply of good quality rental property, *short leases will lead to a curtailment of supply as valuation impacts affect development viability* (see also below).

[9] Where a combination of oversupply and economic recession produced high vacancy rates and falling rental and capital values.

- The second explanation suggests that the lease terms must reflect the business requirements of the occupiers. They argue that since rent represents the landlord/owner's share of the occupation of the site, the property industry should deliver forms of tenure that are best suited to users' needs. With changes in business practice and organisation, greater volatility and innovation in products and services and rapidly changing functional and locational advantages, more flexible forms of occupation are required. The standard institutional lease appears to be too rigid to meet such needs and one would expect to see shorter leases, more variation in lease forms, greater diversity in contractual terms and new forms of occupation.

Lizieri et al argue that these explanations are not mutually exclusive and both contribute to the effect. There may be a 'structural' trend towards shorter leases and this trend may be resisted by landlords in 'normal' markets. However, when markets are out of equilibrium, tenants are able to secure more advantageous terms, which may then become embedded although the restoration of a balance between supply and demand may see some erosion of concessions. In an independent study Crosby et al (2001) supports a structural explanation and identifies the fundamental problem of lease lengths not being compatible with either business planning horizons or a flexible business structure. Certainly the evidence does not support a purely economic argument since if this were the case one might expect to see a more cyclical pattern in behaviour not observed in practice.

In system terms the effect may be rationalised on the basis of economic pressures external to the system interacting with micro-diversity in the system structure (occupational

behaviour and lease lengths) to drive structural change. Given that the main feature of the lease landscape now appears to be diversity with considerable dispersion around the average varying from local market to local market and sub-sector to sub-sector (Lizieri et al, 1997), the critical point does not yet appear to have been reached. Thus the structural implications of these changes are not yet evident. However, systems theory suggests that when the critical point is reached structural change will happen quickly. It is difficult to predict the nature of this structural change, but given that the standard institutional lease provided a large degree of security to institutional funders, a downward pressure on lease lengths could precipitate a fundamental change in relationship between the investment market and the property market overall.

**Property as a commodity and the role of intermediaries**

The data suggests that property has no where near been commodified to the extent that it is a uniform product produced for the benefit of the investment market. There was relatively little dissatisfaction with the buildings occupied by users (only 32% expressed dissatisfaction). Many users, both leaseholders and owner/occupiers had an input to the layout of the building they occupied. Many of the reasons for dissatisfaction actually originated as a result of the age of buildings, in particular as a result of the older buildings not being able to cope effectively with new technology.

It was clear that intermediaries had an important role to play in bringing together the various parts of the system. They are the links in the system diagram and this aspect of structure is examined further in the case studies in the next Chapter. However, it is also

clear that this aspect of structure deserves a more detailed examination than was possible in this work (in particular the extent to which they manipulate the market and market rents).

## REFERENCES

Callender, M and Key, A. (1997). *Value of the UK commercial property stock.* IPD Investment Strategies Conference. Brighton.

Crosby, N. Gibson, V. and Oughton, M. (2001). *A report on the attitudes of occupiers in the UK.* RICS Research Report.

Estates Gazette. (1998).

Fraser, W. D. (1993). *Principles of property investment and pricing.* 2nd Edition. MacMillan.

Lizieri, C. Crosby, N. Gibson, V. Murdoch, S. and Ward, C. (1997). *Right Space, Right Price? A study of the impact of changing business patterns on the property market.* RICS Research Report.

Rodger, R. (1993). Employment, wages and poverty in Scottish cities 1840-1914 in *The Victorian City. A reader in British Urban History, 1820 to 1914.* Longman, London. Morris, R.J. and Rodger, R. Eds.

CHAPTER 7

# Development Case Studies - The Exchange and Edinburgh Park

## INTRODUCTION

The case studies examine the detailed dynamics of the two major programmes of office building undertaken in Edinburgh over the period of the study, **The Exchange**, in west central Edinburgh, and **Edinburgh Park** on the outskirts of the city. The studies are primarily concerned with the main interactions between actors in the development process. They examine the signals given and received between parties to the process[1], whether these signals were used to trigger the development process and the extent to which other factors triggered development e.g. the part the planning system played in triggering development by providing/ determining land use opportunities.

## RESEARCH CONTEXT

Case studies have been used extensively to assess structure and agency models and events sequence models (e.g. Fisher, 1997; Adams, 1994; Birrel, 1997). In particular they have been used to examine actors and events in the development process. The present work does not seek to repeat these studies. Rather the Edinburgh case studies are designed to look at the development process from a systems point of view and to examine the structural links in the system, particularly those relating to the structure diagram outlined in Chapter 4. Thus they are more interested in the dynamics of the

[1] More correctly the communication of information/meaning and their interpretation.

interactions and what actually triggers development, although the actors and events, of necessity, are documented. Of particular interest are:

- The identification of the motives for development and the trigger.
- The importance of land availability and the role of the landowner in triggering development.
- The land owners strategy.
- The process of site assembly.
- Where and when development proposals originated.
- The extent to which the development influenced or was influenced by local plans.
- Communication processes (of meaning and information) in particular:
  - The nature of the market signals and their interpretation on the commencement of development.
  - The relative importance of market signals in the commencement of new development vis a vis the availability of land.
- The network of relationships in the process (who was involved, when, where and the implication), in particular the role of property professionals in the development process.
- The events sequence for the development.

The studies concentrate mainly on the behaviour of the developers and landowners in the developments concerned and in this sense complement the occupier survey described in Chapter 6. Time restrictions have precluded any major study of investor attitudes.

## METHODOLOGY

Both case studies have utilised interviews with a variety of agents. These include developers, property agents, ex-City of Edinburgh Council employees involved in early work on the projects (and still involved as project managers or developers) and representatives of the City of Edinburgh's Economic Development Group, Edinburgh International Conference Centre (EICC) Ltd., and the EDI Group. The studies have made use of existing literature on both schemes including newsletters, promotional and advertising literature. Structure and local plans have provided insights into strategic thinking. A variety of maps, pre-dating the respective developments, have been used to place the developments in an historical perspective.

## AN OVERVIEW OF THE DEVELOPMENTS

### Edinburgh Park

Edinburgh Park is a 144 acre (58ha) business park with planning permission for 219,363m$^2$ of offices (New Edinburgh Ltd., 1999). It is being developed by New Edinburgh Ltd., a joint venture company formed between the Miller Group and the EDI Group (see below and Appendix 13). The overall scheme, which is strongly influenced by the New Town in Edinburgh (Edwards, 1989), was master planned by New York architect, Richard Meier. It emphasises the environment and already boasts three lochans and extensive landscaping. The original master plan is reproduced in Figure 7.1 and a map of the Park area, which includes the component site locations, is given in Figure 7.2. The latter indicates the extent of the developed area at the time of writing (Site A1 is currently under construction).

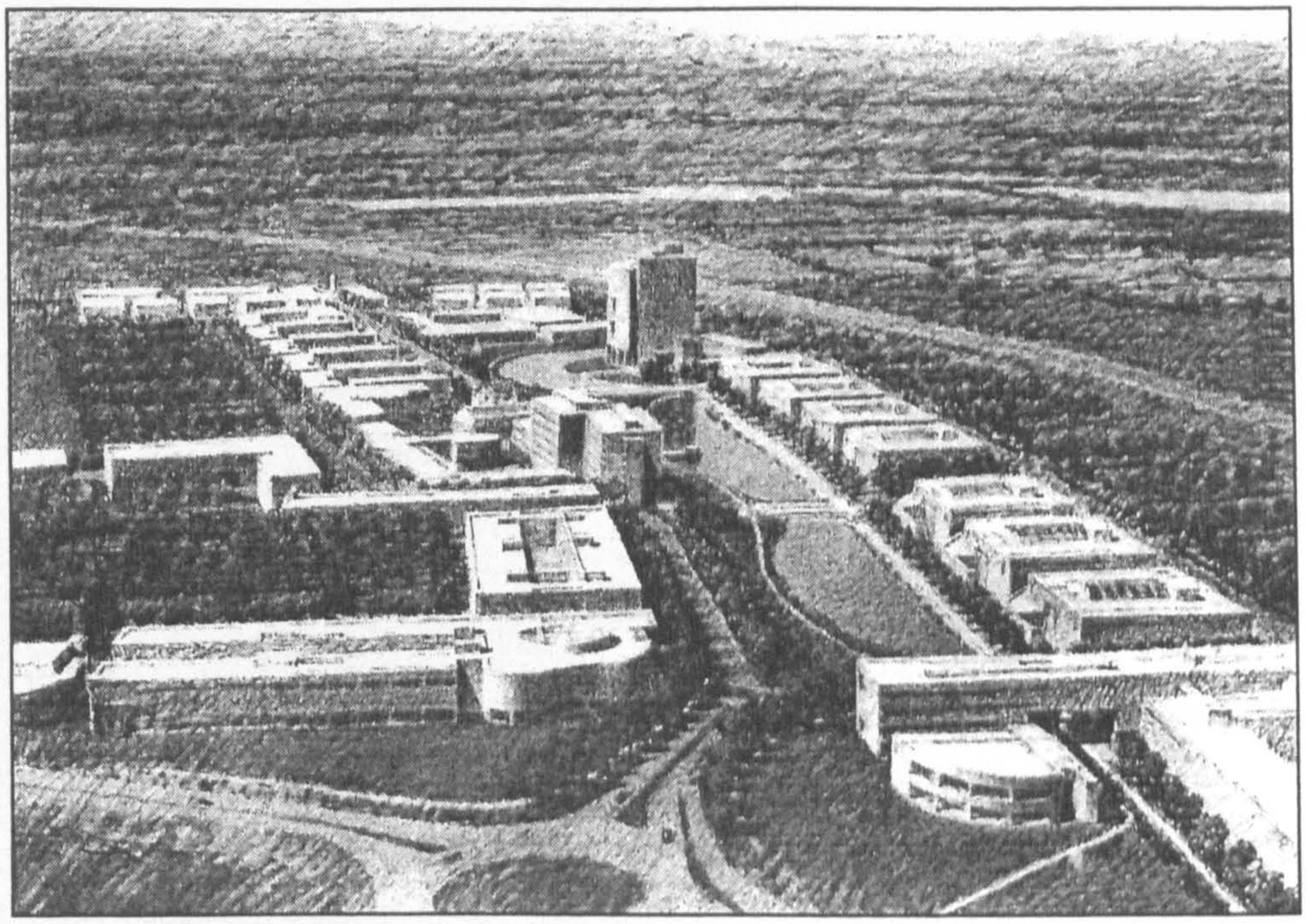

**Figure 7.1. Richard Meier's Master Plan**

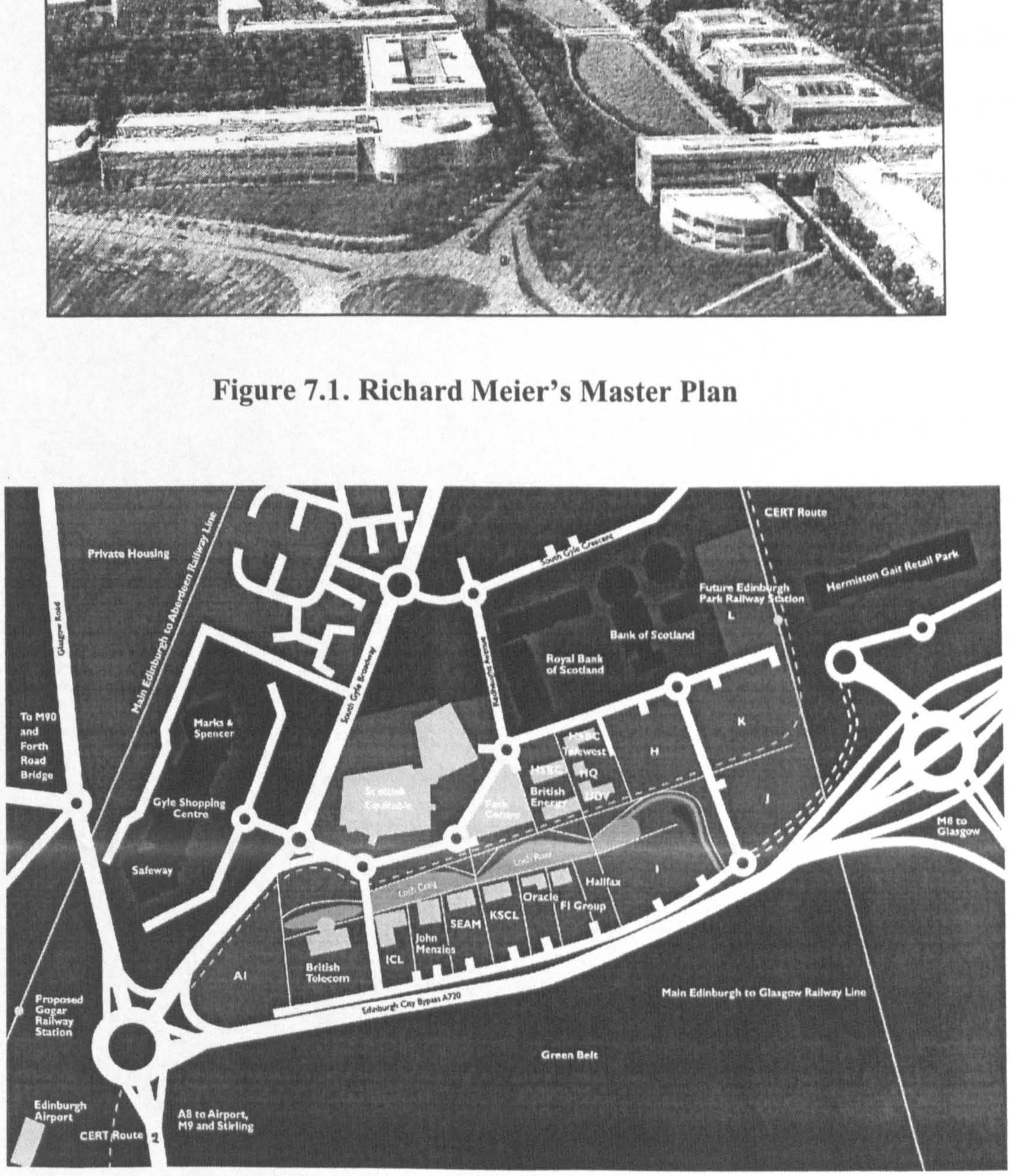


**Figure 7.2. The South Gyle Development area**

The Park is some three and a half miles from the centre of Edinburgh and is part of a wider development which includes the Gyle Retail Park. It borders the City by-pass, with a direct link to the M8 and Glasgow. Eventually, it will boast a main line railway station as well as a direct link to the City centre via a Rapid Transit Link. The scheme was first conceived in the early to mid 1980s, a planning inquiry was held in December 1988, outline Planning Consent granted by the Secretary of State for Scotland in June 1989 and the Master Plan for the site produced in 1989. Work commenced in 1992 (preliminary groundwork in 1991). The first building was occupied (by John Menzies) in October 1995.

**The Exchange**

The Exchange is the new financial district nearing completion on a 3.8ha (9.5acre) site in West Central Edinburgh. The main site was formerly occupied by the Caledonian Railway Station and goods yard and is being developed by EICC Ltd.[2] (see below and Appendix 13) according to a Master Plan produced by Terry Farrell in 1989 (Figure 7.3). It represents a total investment of some £400m with the £38m Edinburgh International Conference Centre (completed in 1995) as its flagship (Cousins, 1995). Ultimately it will provide over 1 million $ft^2$ (92,940$m^2$) of high quality, fully networked, computer friendly office space in the centre of the City (Cousins, 1995). The case study considers the developments at the core of The Exchange (the area bounded by the Lothian Road and Morrison Street). It does not include Saltire Court, which pre-dates the main development[3], or the Scottish Widows building (not developed by EICC Ltd.).

---

[2]. In conjunction with various private development and construction companies.

[3] Even though, in a sense, the City of Edinburgh District Council cut its teeth with this development. It was completed in 1991 before any of the developments considered here, including those on Edinburgh Park.

Neither of these buildings are formally part of the original Master Plan although they fall within the development concept of the West Central Business District.

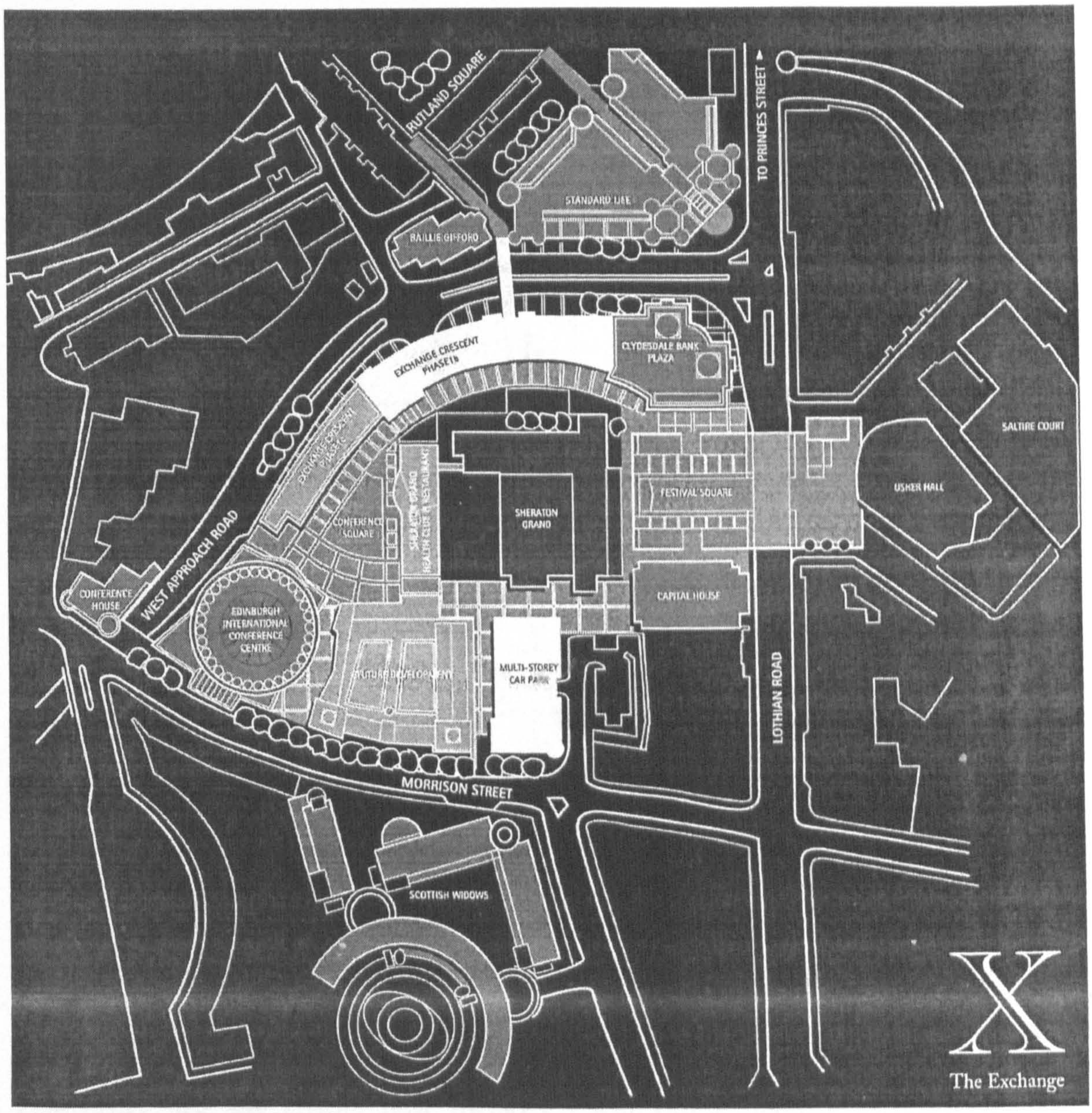


**Figure 7.3. The Exchange Master Plan**

Progressively other buildings are being incorporated into the so-called Exchange District. Figure 7.4 below indicates the current extent of the Exchange District.

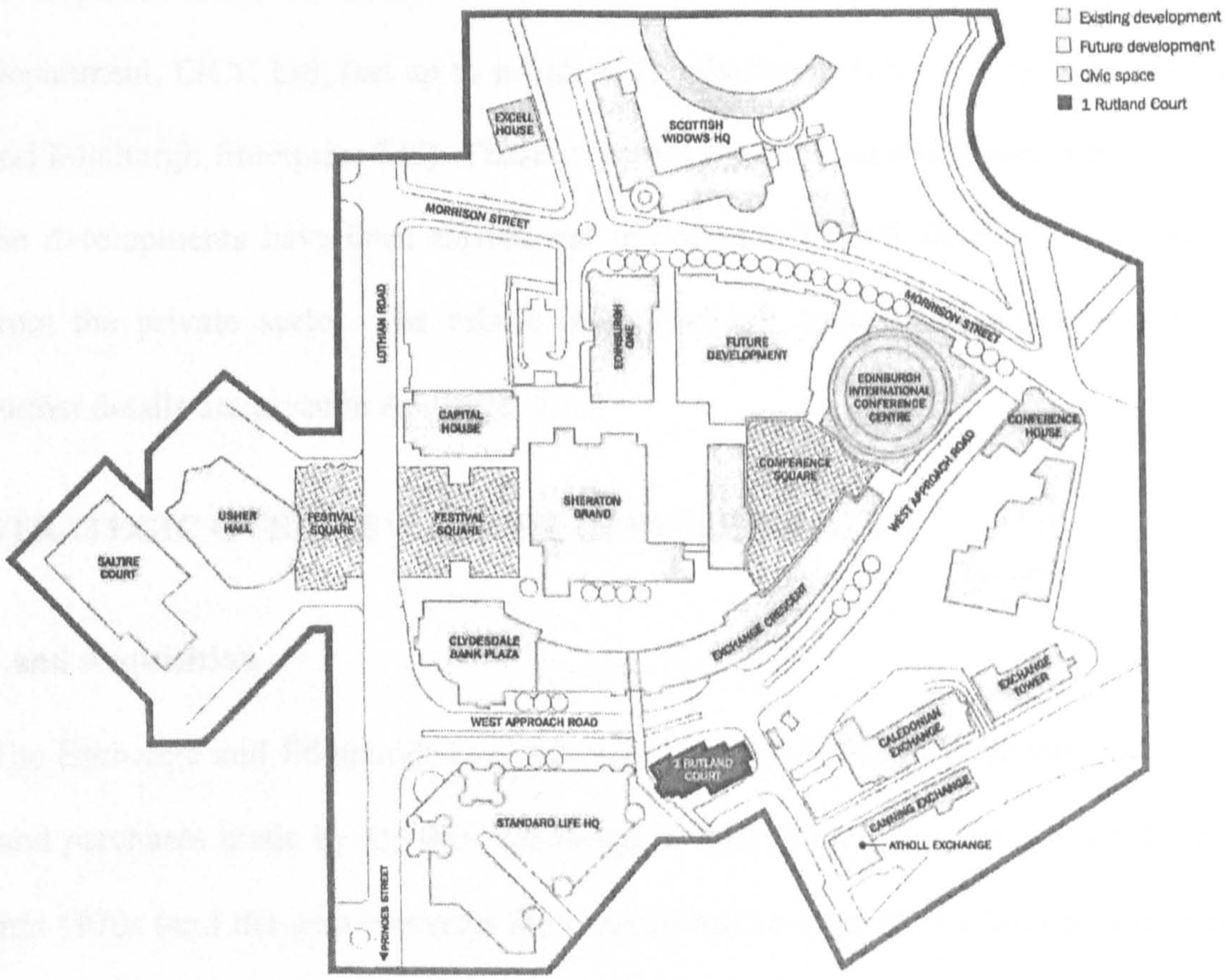


**Figure 7.4. Other developments in The Exchange**

The multi-storey car park scheme planned in Morrison Street has become the Edinburgh One office and the district now includes Excel House opposite Scottish Widows, Exchange Tower, Canning Exchange and Caledonian Exchange. However, like the Scottish Widows building and Saltire Court, these are not considered in the case study because they did not form part of the original Master Plan.

## THE CITY'S DEVELOPMENT AGENTS

A feature of the development policy for both of these schemes has been the collaboration between the EDI Group[4] (the City of Edinburgh Council's primary development arm), the Economic Development team within the City's Development Department, EICC Ltd. (set up to progress The Exchange scheme) and LEEL[5] (Lothian and Edinburgh Enterprise Ltd). These represent the main development agents although the developments have been carried out in conjunction with developers and builders from the private sector. The relationships between these various organisations and further details are given in Appendix 13.

## STRATEGIC OVERVIEW OF THE DEVELOPMENTS

### Land Acquisition

The Exchange and Edinburgh Park schemes were made possible by virtue of strategic land purchases made by the then Edinburgh District Council in the late 1960s/early to mid 1970s (and the active interest the Council had in them over a long period of time). These tracts of land formed the core of the land subsequently developed. In the case of the Edinburgh Park and associated schemes, the City had acquired tracts of land in the South Gyle area in the early 1970s under the 1967 Lands Commission Act (Wall, 1998) and the development of a modern planned industrial estate began in 1973. This was largely under the control of the Edinburgh District Council as landowner. It was the single most important component of the city's industrial land resource (City of Edinburgh District Council, 1994). It had long been recognised, however, that land

---

[4] Previously Enterprise Edinburgh and latterly Edinburgh Development and Investment Ltd.- see Appendix 1.

[5] The Council was the first unitary authority to agree a joint strategy (Edinburgh's Economic Future) with its local enterprise company.

between that estate and the city bypass road provided an opportunity for major expansion of the estate when needed (see Figure 7.5 later). A dual carriageway was run through the land in anticipation of this development (Wall, 1998).

In the case of the Exchange scheme, the majority of the site was purchased from British Rail in 1968 with no immediate development plans in mind. It was more of a strategic land bank purchase, being close to the City centre (Donaldson, 1998).

**Regional and Local Planning Overview**

In terms of formal strategic planning[6], the Lothian Region Council (LRC) Structure Plan of 1985 was a watershed as it marked a departure from previous policy with regards to office development in the Region. A policy of restraining most office development in the central area of Edinburgh had been in operation since 1973. The main aims of the restraint policy for central Edinburgh were controlling commuter traffic levels, 'safeguarding' the architectural heritage of the City and avoiding the loss of residential uses. The effect of this policy was to increase pressure for office development in the adjoining, predominantly residential, inner suburbs. The 1978 LRC Regional Plan had sought to direct offices in a positive way to suburban Edinburgh and its district towns. From 1979, however, major offices were also discouraged in the inner suburbs, except Leith and Haymarket. This overall policy had given Edinburgh a reputation for discouraging office development (Lothian Region Structure Plan, 1985) and may have resulted in the loss of office jobs from Lothian to other regions[7]. As a consequence the

[6] Formal since the evidence is that a lot of informal discussions concerning these sites had been taking place prior to this structure plan.

[7] It has been argued that inward investment to Edinburgh from England and overseas might have been greater in the mid 1980s had larger tranches of office accommodation been available – see egi Archive, 1994.

1985 Structure Plan enabled further office development in central Edinburgh to secure new jobs at the hub of the rail and business networks. It confirmed, however, the strict office restraint policy in the inner suburbs to prevent the spread of offices into residential areas.

To ensure that the inner suburbs were not subjected to further office pressures, the 1985 Plan noted that development opportunities would be made available, where appropriate, in the outer areas of Edinburgh as well as in the district towns and at Livingston. It anticipated that relaxation of the restrictions on office development would be beneficial to employment, encouraging office jobs in banking, finance and related services and helping to offset job losses in other industrial sectors. In this context, the plan recognised the distinction between the different requirements to locate offices in the centre of Edinburgh, compared to those that could be located beyond the central area. Thus they recognised that:

- Offices in the financial sector had traditionally been established in the centre of the city since they depended heavily upon the services of each other and the constant interaction and communication with other central offices. To be part of this inter- relationship was (is) one of the reasons why offices sought out the prestige of the city centre location.
- There are offices that do not depend upon such close ties and these can locate beyond the central area.

Interestingly, although the plan supported out of town development it made little mention of Edinburgh Park per se.

Although the 1985 LRC Structure Plan (wrongly as it happens) anticipated that the majority of demand for office space in the region would be met in central Edinburgh, it did acknowledge that development would be accepted on suitable sites in outer areas[8]. Preference would be for those sites which displayed some of the advantages of central Edinburgh, including good public transport accessibility and proximity to a good level of local services.

The 1994 LRC Structure Plan appeared to be tidying up and confirming many of the decisions which had been taken in the mid-to late 80s and early 90s rather than driving new development. It noted that office development should continue to be encouraged to locate in the city centre, but that some office functions, such as a large data handling activities, could be located in peripheral locations "as has already occurred at South Gyle" (p100). By this time the Lothian Regional Council had identified and confirmed the City centre and South Gyle as the main concentrations of service sector job growth. It was, however, still worried by traffic and noted that the committed developments at South Gyle could be more easily reached by public transport than more dispersed locations.

Interestingly, the 1994 Plan took the view that providing for growth in these locations justified controls elsewhere in the built up area of the city. The Regional Council

[8] Where the demand could not be met by office space in the City centre.

appeared to be using these new developments as a basis for restricting office development elsewhere and appeared to be developing the concept of strategic centres. Thus the plan notes (Page 105) that "[an opportunity exists] to encourage offices to concentrate in a small number of strategic centres, where they would benefit from proximity to complementary services while also being accessible by public transport". Only now do the Regional Council describe the boundary of what it envisages as the 'City Centre business centre' (LRC 1994, p106), which is wider than the Exchange scheme (see above and subsequent developments in this area). It also describes the nature of the new office development at South Gyle (which is now described as the Region's second office centre). The 1994 plan also contains first reference to the Edinburgh International Conference Centre. The policy statement (ED 17) reads "The Regional Council will encourage major office development to locate in the strategic business centres of Edinburgh City centre, South Gyle, Leith and Livingston, the boundaries of which should be defined in local plans".

## EDINBURGH PARK

### Planning Issues

The 1985 LRC Structure Plan was almost certainly anticipating future development of the industrial estate at South Gyle. It is likely the LRC would have been aware of the discussions between the City of Edinburgh District Council, Mark & Spencer plc, Wimpey Holdings and Associated Dairies concerning the so-called Maybury Park development which had been ongoing for two years on and off[9]. In addition a

[9] A press release of 5 Dec 1985 by City of Edinburgh District Council announced a "joint development by M&S, ASDA and Wimpey with the cooperation and participation of the City of Edinburgh .....is the culmination of two years consultation and negotiation between the partners.....to be known as Maybury Park (City of Edinburgh District Council, 1985).

Supplementary Statement for the NW Edinburgh Local Plan – *The South Gyle Area: A Strategy for its Future Development* had been approved by Edinburgh District Council Planning and Development Committee in December 1985 (see Cameron, 1987). This outlined proposals for a Business Technology Park which it suggested would provide the City with an opportunity to further expand its industrial base and make provision for its expanding indigenous technology based industries and financial services. It notes that the Technology Park "accords fully with the LRC Structure Plan with respect to land allocations for industry and support for the development of high tech industry per se". The document also notes that "equally important is the contribution which the Business Technology Park can make towards relieving the pressure on the City Centre for office development".

By 1992 the North-West Edinburgh local plan was identifying a 52 hectare site at South Gyle as an area for out of town development (NW Edinburgh Local Plan 1992, page 14), although, as noted, between this plan and the Lothian Regional Council Structure Plan of 1985:

- Enterprise Edinburgh had been set up to carry forward the Edinburgh Park scheme.
- The Master Plan had been produced.
- A Planning Inquiry had already been held.
- The Secretary of State for Scotland had granted outline planning consent.
- The first work was about to commence on the site.

Given the thinking behind the LRC 1985 Structure Plan, it was not surprising that the South Gyle site was chosen for a major development. In keeping with the 1985 LRC Structure Plan, the 1992 local plan confirmed the allocation of some 75 hectare of land in total for business development (23ha of already serviced land on which development was proceeding/completed and a further 52 ha of newly allocated land taking the estate up to the city bypass). It imagined the area as having the accessibility and environmental qualities to provide a prestigious location for industry, particularly the expanding higher technology industries, and to make a major contribution to the economic well being of the city. Interestingly, however, given the apparently already advanced stage of development planning, the plan envisaged development primarily for businesses which "utilise or service the innovative and advanced technologies and other businesses of a prestigious nature such as headquarter offices" (p15).

The 1992 plan did not view the development as one that involved offices exclusively. It did, however, envisage low-density buildings with a special control exercise to insure that high standards of building design and landscaping were maintained (reflecting Richard Meier's Master Plan). The plan also noted that development of the site would be based on a design brief restricting use as noted above. The policy statement read (POLICY ED 4) "Land at South Gyle defined BUS 1 on the proposals map will be developed as a high amenity business technology park and will be restricted primarily to high technology businesses, both manufacturing and service, and offices. A careful control will be exercised to secure exceptionally high standards of building design, layout and landscaping. Development of the site will be based on a design and development brief to be prepared in consultation with the developers". (p15)

## Site assembly

As noted, the City of Edinburgh Council had acquired tracts of land in the South Gyle area in the early 1970s under the 1967 Lands Commission Act (Wall, 1998), and a modern planned industrial estate had been in the course of development since 1973. It had long been recognised, however, that land between that estate and the city bypass road provided an opportunity for major expansion of the estate when needed. In December 1985 the Supporting Statement for the draft NW Edinburgh Local Plan (1985b) identified 96ha (237 acres) of unbuilt land contained by the existing industrial estate the Fife and Glasgow Railway lines to the north and south respectively and the still to be built City by-pass. The strategy document proposed that this tranche of land should be developed as follows (see Figure 7.5 page 193):

- General industrial land (extension of existing industrial estate) - 22ha.
- Housing - 11ha.
- Retail and commercial development - 11ha.
- Science and Technology Park - 52 ha.

The ownership of the land at this time was approximately as indicated in Figure 7.6 (Page 194). This strategy document appeared simply to reflect the conclusions of some two years of discussion between The City of Edinburgh District Council, Associated Dairies, Marks and Spencer plc and Wimpey Homes since a number of things happened at the same time:

- The Strategy document was produced in November/ December 1985 and approved by The City of Edinburgh District Council in December 1985.

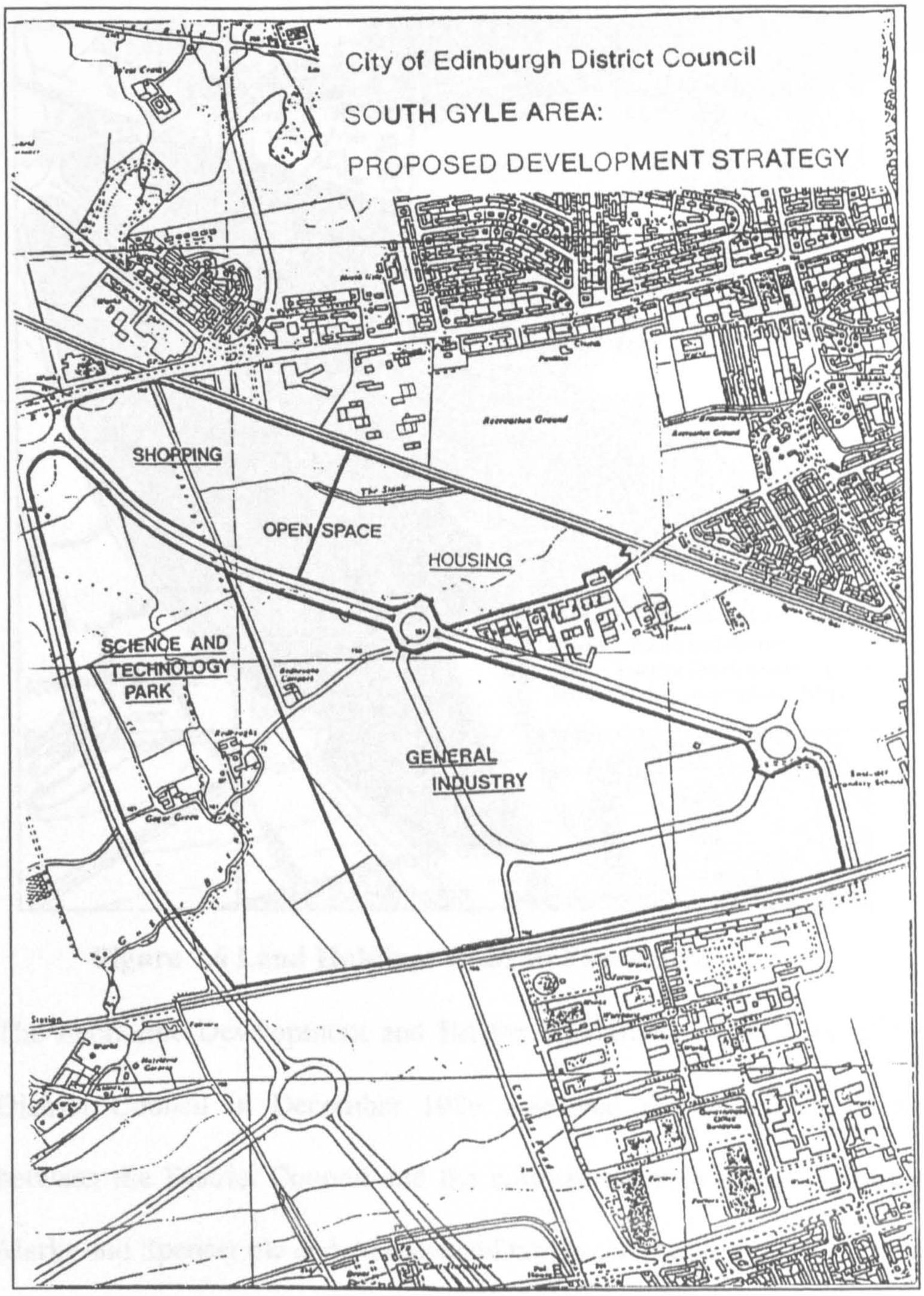


**Figure 7.5. Proposals in the South Gyle Development Strategy**

- The first outline planning applications were made in 1985.
- Supporting documents for the planning applications (Associated Dairies et al 1985) reflected the outline development shown in Figure 7.5.

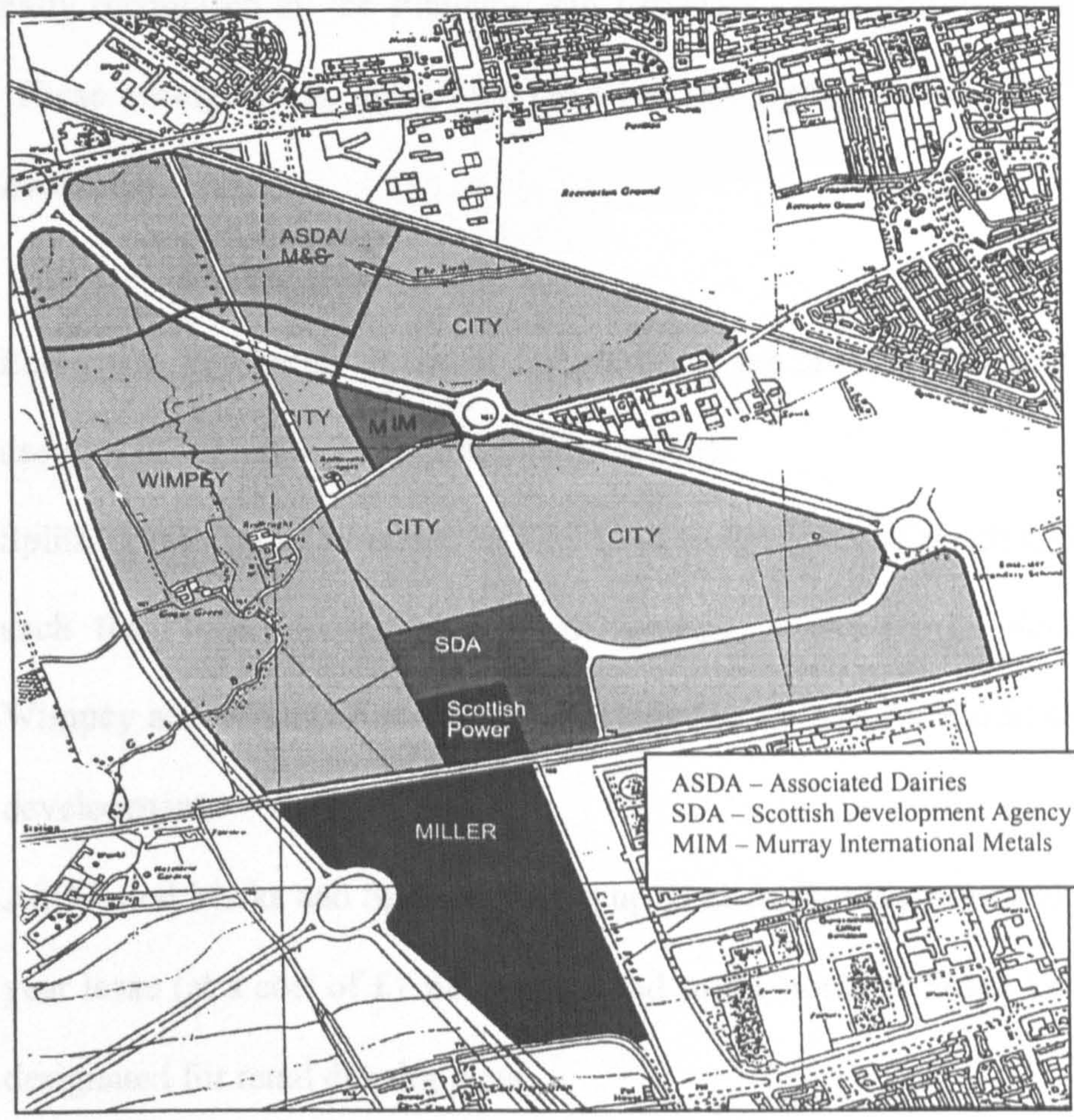


**Figure 7.6 Land Holdings Prior to Excambion**

- The Economic Development and Estates Committee of the City of Edinburgh District Council in December 1985 approved the excambion arrangements between the District Council and the consortium of Wimpey Construction plc, Marks and Spencer plc and Associated Dairies (see below).

Indeed, Wall (1998) notes that "a conscious effort was made by The City, Marks and Spencer plc ASDA and Wimpey to undertake a comprehensive development of the whole site"

The excambion arrangements recognised the inter-related and inter-dependent nature of the retail, business park and housing elements of the overall scheme although this was

not formally recognised by the Planning and Development committee until 1987 (see below). These arrangements, agreed by 1985 but not legally sealed until 1989 (Wall, 1998), involved:

- Enterprise Edinburgh obtaining or retaining the freehold interest in the land designated for retail development (Figure 7.5).
- Splitting the 23 ha (57 acres) of City land to the north of South Gyle Broadway such that 16ha (40 acres) were designated for residential development by Wimpey and 6.9ha (17 acres) were included in the site for the South Gyle retail development.
- ASDA and Marks and Spencer giving up their freehold interest and taking a 125 year lease (at a cost of £1 pa) on the land to the north of South Gyle Broadway designated for retail development.
- Enterprise Edinburgh taking the freehold on the business park land and retaining its interest in the land designated for industrial use.

Effectively, these arrangements gave the Edinburgh District Council the freehold interest in all of the land designated for new development apart from that assigned to housing and a 10 acre parcel of land held by Murray Holdings (MIM, Figure 7.6). The latter developed their land independently of the ASDA/City/M&S/Wimpey consortium. Outwith these arrangements, the City leased a 9.5 acre parcel of land to the Carroll Group of Companies for the development of South Gyle Park and sold a substantial site to the Royal Bank of Scotland for the construction of over 40,000ft$^2$ of offices (see Figure 7.2 and Meier, 1991).

The importance of the project to ASDA, Wimpey and M&S is highlighted by the readiness with which they gave up their freehold interest to the City of Edinburgh District Council for the sake of progressing the overall development. Remarkably, on the retail site ASDA and Marks and Spencer agreed to build some 73 shops, as apart of the development, which included their own super stores, and to assign the feuhold of these shops to the City of Edinburgh Council.

The land held by Miller was acquired by New Edinburgh Ltd in January 1991 when the joint venture company was formed. This 7 acre site was used to develop Hermiston Gait retail park and a Royal Mail sorting centre.

**Site development**

The outline planning applications submitted by Associated Dairies Group (ASDA), M&S plc and Wimpey Homes Holding Ltd in 1986 largely duplicated[10] an earlier application in 1985 and called for:

- A district shopping centre on 20ha of land with up to 400,000ft2 of retail space consisting of:
  - An ASDA superstore of 100,00ft2.
  - A M&S Store of150,000ft2.
  - 73 small shops (see also above).
- A private housing development on 16ha of land.
- A high tech park on 50ha.

[10] The main difference between the 1985 and 1986 applications is that the former requested 400,00ft² of retail space whilst the latter requested up to 400,000ft² of retail space.

The land allocations are slightly different from those finally agreed in the excambion arrangements (which in turn reflect, more or less, the 1985 Strategy Document). Documents supporting the applications (Associated Dairies et al 1985) make it clear that the proposals were in conjunction with the Edinburgh District Council. Interestingly the documents also suggest that the proposals *originated* with ASDA and M&S. The 1985 proposals were called in by Lothian Regional Council on 13 Jan 1986. The 1986 proposals were submitted to Edinburgh District Council on 14 March 1986 and called in by LRC on 28 April 1986.

As noted, in December 1985 The City of Edinburgh Planning and Development Committee approved the draft strategy document for South Gyle (The City of Edinburgh District Council, 1985b) which matched the planning applications fairly closely. At the same time the Economic Development and Estates Committee approved the land excambion arrangements 'to facilitate the development of the strategy'. Importantly they also approved a capital grant of up to £1.5M for infrastructure development and for servicing and creating a 'Science and Technology Park on the land to be acquired from the consortium' (Cameron, 1987).

Little had changed by February 1987 when David Cameron, Depute Director of planning submitted a review of progress (mainly on the retail proposals) to The City of Edinburgh District Council's Planning and Development Committee (Cameron, 1987). The Planning and Development Committee, remarkably, had still not made a formal decision on the application by ASDA, M&S and Wimpey. Cameron's report reviewed the 1985 South Gyle Strategy Document and agreed that the individual parts of the strategy were inter-related and inter-dependent. It also noted that the implementation of

the package was also 'inter-related with the land excambions between the owner developers and the capital receipts funding the business technology park development' (see above). It noted that whilst parts of the new package were able to proceed independently, for all the parts to proceed comprehensively, it was important that the overall strategy be treated as one proposal and not as individual items. The report recognised the LRC and the SoS for Scotland as the planning authorities rather than the District Council and recommended that:

- The Council should acknowledge that the strategic question of development was one for LRC.
- Maybury Park (Edinburgh Park) should be considered as part of a wider package that included the retail and housing element.
- The district Council should advise the LRC that the comprehensive package as outlined in the Strategy Document for South Gyle was the preferred option.
- The retail element should not be considered in isolation.
- The council accepts the principle of the applications for Maybury Park as its preferred proposal.

Cameron concluded that such a decision would allow him to negotiate the scale of the shopping development and allow the Council to promote the overall development strategy for South Gyle.

All of this smacks of the planning arm of the Council and the Council per se staying at arms length from their development arm who were joint proposers of the whole project.

This was especially important given that the City were proposing to use (or at this stage may have been using) capital receipts to develop the proposal (see above).

By 1988 the City's Department of Economic Development and Estates (City of Edinburgh District Council, 1988) was noting that "the proposed development of the Business Technology Park by Enterprise Edinburgh on behalf of the District Council .....proposals now await planning approval by the SoS for Scotland which it is hoped will be granted in the next few months. If the combined package is approved then development will commence in the summer of 1989". In addition, Enterprise Edinburgh would "ensure from the very start the highest quality of design and will appoint an architectural practice of international standing and intends to announce the firm in question next month". In the event, the planning inquiry for the Park was held in December 1988, Richard Meier was appointed in 1989 to produce the Master Plan for the Park (Carswell, 2000). The SoS for Scotland granted outline planning consent for Edinburgh Park on 26 June 1989 (Langford, 2000).

Work started on the site in 1991 with the diversion of a major gas main (Scotsman, 1993) and work began on the Park infrastructure in 1992. By this time The Maybury Business Technology Park had become Edinburgh Park and the flexibility in accommodation[11] originally proposed had become virtually all office accommodation. Enterprise Edinburgh used a combination of capital receipts raised against the value of leases on the site and the sale (for around £6M) of the 8ha (20 acre) Scottish Equitable site to (Carswell, 2000):

[11] The 1992 NW Edinburgh Local Plan 'accepted that some buildings will be flexible, perhaps indeterminate in use, involving the combination in single premises of research and development, production, storage and office functions'.

- Develop the Master Plan (approx £0.5M).
- Put the whole scheme together.
- Put in the first phase of the site infrastructure.

Thereafter income to the developers (New Edinburgh Ltd) was used to put in infrastructure on a rolling basis. Apart from the Leisure Club and Café facilities all of the buildings have been constructed for office use. A summary of completion dates, current occupiers and, where known, owners, is given in Table 7.

**Table 7. Site Development, Edinburgh Park**

| Address | Current Occupier | Owner[1] | Net Area[2] ($m^2$) | Completion date |
|---|---|---|---|---|
| Plot D2 | John Menzies | | 3,606 | 1995 |
| Plot D1 | ICL | | 2,974 | 1995 |
| Plot C1 | British Energy | AMP Asset | 2,787 | 1995 |
| 1-2 Lochside Cresc | Scottish Equitable | Scottish Equitable | 23,238 | 1996 |
| Plot E1 | Kingston SCL | | 3,718 | 1997 |
| Plot C2 | Midland Bank | Friends Provident | 3,764 | 1997 |
| Plot A2 | British Telecom | | 11,154 | 1999 |
| Plot D3 | SEAM (Scottish Equitable) | CGU/Morley Properties Ltd. | 7,900 | 1999 |
| Plot G2 | HQ Business Centres | | 2,184 | 1999 |
| 1-2 Lochside Way (Plot G3) | Telewest/HSBC Global Fund Services | | 3,904 | 1999 |
| Plot E2 | Oracle | GA Investments | 3,611 | 1999 |
| Plot F1 | F1 Group | Friend First Life Assurance Co Ltd. | 3,020 | 1999 |
| Plot G1 | United Distllers and Vintners | New Edinburgh Ltd | 3,718 | 1999 |
| Plot F2 | Halifax | | 5,112 | 2000 |

1. Ownership data from egi (2000).
2. All floor areas are net and taken from data in various Edinburgh Park Newsletters.

# THE EXCHANGE

## Planning Issues

The first formal recognition of the need to develop Edinburgh's central business district came in the Lothian Regional Council Structure Plan of 1985. The plan noted (OP1 page 21 "The regional council will support the change of use and rehabilitation of existing buildings and the construction of new developments for office use in central Edinburgh where:

i. Existing housing is not lost.

ii. Conservation policies/ listed building controls/the high buildings policy/design standards are maintained.

iii. Traffic circulation requirements are met.

iv. The Regional Council' car parking standards are achieved. "

As noted, there is a suggestion that the Regional Council were already anticipating an Exchange type scheme when it wrote the plan and it appeared to be bringing together a more comprehensive policy for central Edinburgh, perhaps with proposals already on the table before the plan was issued. Consistent with this view the plan goes on to note "offices of the financial institutions and its supporting professional firms have traditionally located around at George Street in central Edinburgh. Opportunities for expansion and development in this location are physically restricted. To enable the finance sector to achieve its growth potential a new area for prestige office development needs to be identified close to the existing core at George Street. An area of about 4 hectares should be sufficient to cater for the expansion needs of the finance sector". OP 2 subsequently reads "Subject to the requirement of OP1, local plans for central Edinburgh should identify an area for prestige office development".

## Site assembly

The Exchange is centred on a 3.8ha (9.5acre) site in West Central Edinburgh. The assembly of this site has been relatively more straightforward than that of Edinburgh Park. The majority of the site is owned by the City and has been progressively assembled since 1968. The original purchase was of a tract of land formerly occupied by the Caledonian Railway Station and goods yard and owned by British Rail (see Figure 7.7 dated 1968). It did not include the site on which Conference House and the

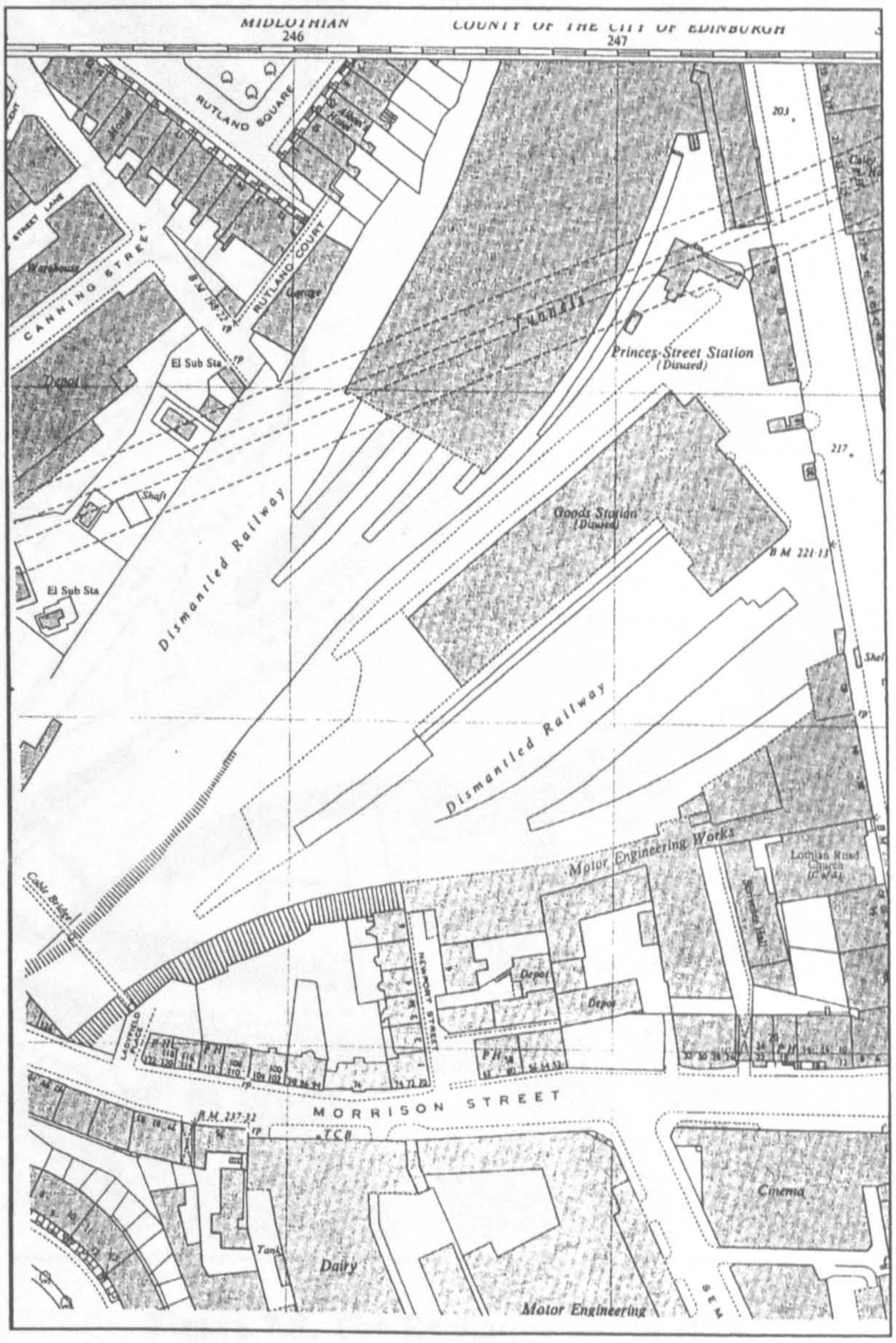


**Figure 7.7. The main Exchange site (1968)**

Conference Centre now stands, part of the north side of the site now occupied by the Standard Life building (owned by the Caledonian Hotel) and the frontage on Morrison Street. The Conference Centre site together with the Conference House and Morrison Street site were acquired subsequently by the City and the whole area leased to EICC Ltd. The present Standard Life site was split as shown in Figure 7.8 (dated 1978). The southern part of the site between the Caledonian car park and the then

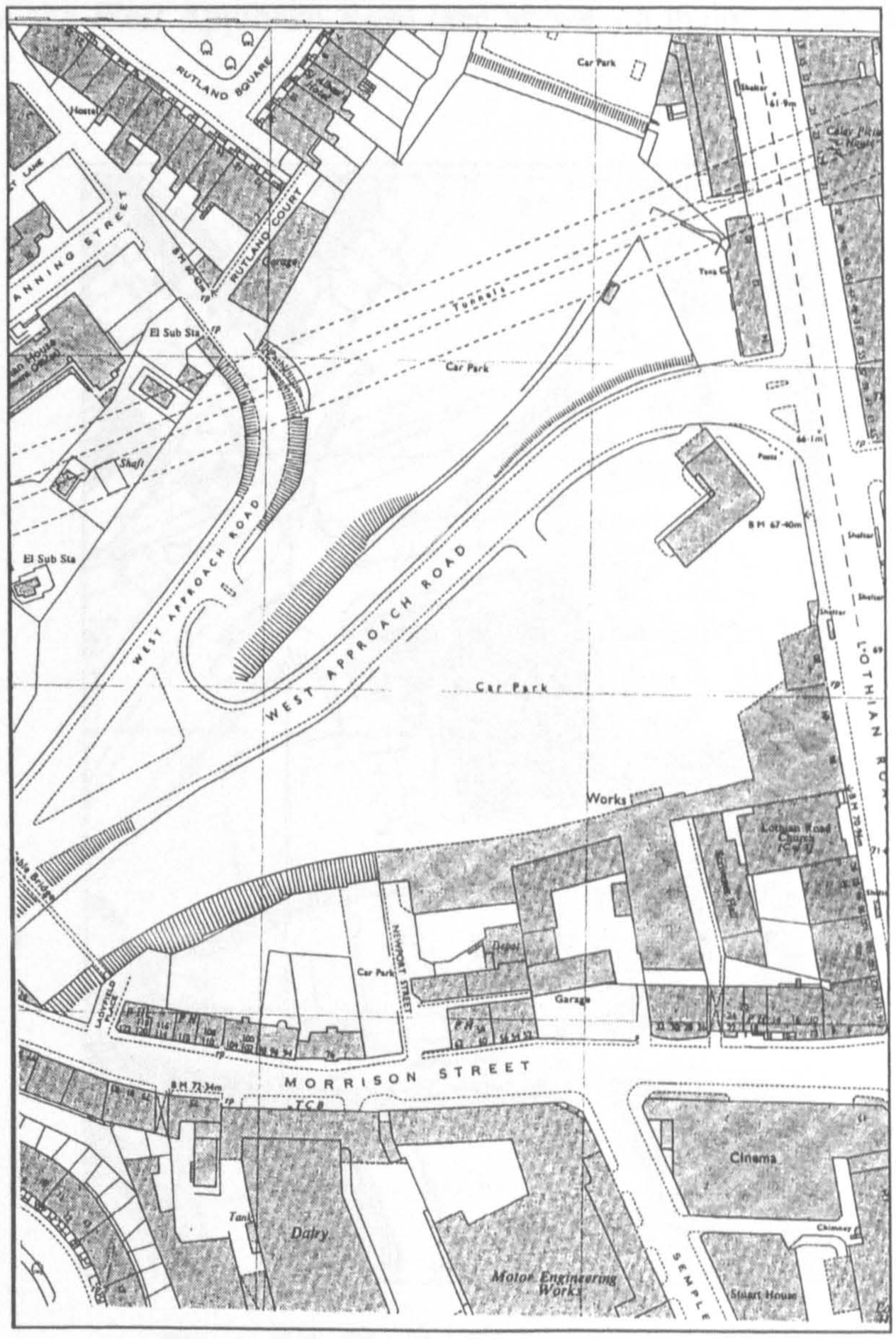


**Figure 7.8. The Exchange site in 1978.**

route of the West Approach Road were part of the British Rail deal (the boundary being straightened as part of the deal – Donaldson, 1998). The Caledonian car park was

acquired direct by Standard Life when the decision was made to construct the Standard Life building (Donaldson, 1998). The Scottish Widows Building was built on land south of Morrison Street acquired independently by the Scottish Widows.

Purchased by the City with no immediate development plans in mind[12], the City owned site remained undeveloped for many years[13] save for its use as a car park and the construction of the West Approach Road (see above - a major approach road into the City centre).

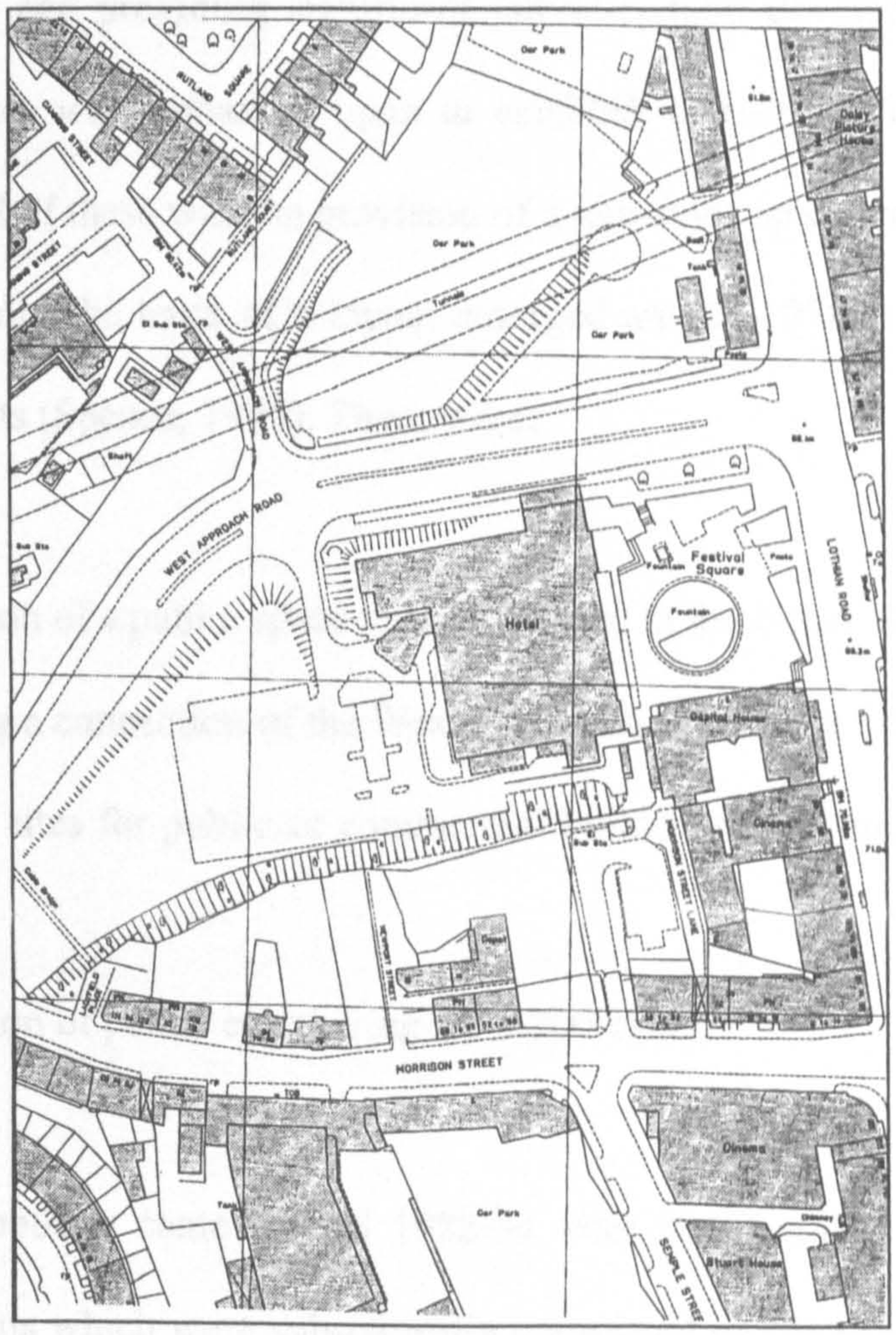


**Figure 7.9. The Exchange site in 1986**

[12] The District Council had taken the opportunity to purchase the land for its land bank and treated the purchase as a once in a lifetime opportunity to acquire land in the centre of the City (Donaldson, 1998).

Controversial plans to construct an inner ring road subsequently limited any notion of development well into the 1970s and generally depressed the wider West Central Edinburgh area (Spence, 1995). The final abandonment of these plans precipitated action towards redevelopment (Spence, 1995).

**Site development**

Early consideration for the development of the area focussed on the goods yard site (Spence, 1995) with a view to attracting major commercial buildings as well as boosting the local economy and providing significant public/cultural development. A range of urban design studies was embarked upon to establish a framework for development. Common to several of these was the provision of a new civic space generated on an axis from the Usher Hall. The basis of a layout emerged around 1978 with a brief to meet several requirements (Spence, 1995). These were:

- The provision of a public space visually related to the Usher Hall.
- Maintaining a connection of the West Approach road to the Lothian road.
- Describing sites for public or commercial buildings focusing on the new public space.
- The provision of public car parking for 1,200 cars.

The first solid proposals came around 1982-84 with the Sheraton Hotel and Capital House developments which were subsequently completed in 1985 (see Figure 7.9). The City of Edinburgh District Council commissioned the design for Festival square at this time to enhance the setting of these first buildings (Spence, 1995).

---

[13] Until the mid 1980s when the Sheraton Hotel and Capital House were built.

The 1985 LRC Structure Plan and other concurrent planning and economic studies for Edinburgh stimulated the next phase of activity (Spence, 1995). The Edinburgh District Council in consultation with the LRC and the Scottish Development Agency promoted the idea of a major new conference centre as a strategic investment to promote other development in the City and to expand Edinburgh's visitor economy (Donaldson, 1998). The City produced a joint Planning and Economic Development Policy (1987) of which the principal central area component was the West Central Edinburgh Redevelopment Strategy – from Castle Terrace in the east and the Haymarket area in the west (Spence, 1995). The City Council briefed a development competition for the gap site in Castle Terrace (Saltire Court) in 1987 and shortly afterwards embarked on a competition brief for the goods yard site (Spence, 1995). A prime objective of the latter was the realisation of a conference centre of international status. The competition was won by Terry Farrell in 1989 and a Master Plan for the site produced by 1991. In the intervening period, and separate from the Master Plan, the City sold a small parcel of land to CALA UK who developed the Baillie-Gifford building independently (completed 1991 see Master Plan map).

In order to accommodate the Farrell plan the City acquired additional tranches of land including the present site of the Conference Centre and Conference House and the land between the goods yard and Morrison Street. In addition, EICC Ltd. was set up in May 1991 (Wilson, 2000) to project manage the whole scheme. It became the tenant of five leases covering all of the land that now constitutes the Exchange site i.e.:

- The Conference Centre.
- The Conference House site.

CALA-Morrison bid for the so-called Plaza phases (Clydesdale Bank Plaza, Exchange Crescent Phases 1b and 1c). They built Clydesdale Bank Plaza on land leased at £10pa and had an option to phase further development on that part of the site fronting the West Approach Road now called Exchange Crescent. Subsequently British Railways Pension Fund bought the Clydesdale Bank Plaza land and buildings, getting the feu when the building was completed in 1997. A caveat was included such that EICC Ltd got the Phase 1b land *back if the market did not make development on that part of the site acceptable*[14]. The commercial decision to go ahead or hand the land back was left to CALA-Morrison (Donaldson, 1998). The latter decided to assess the success of the Clydesdale Bank Plaza scheme before making a decision on the development of the remaining phases of the Plaza development. In the event, Standard Life approached EICC Ltd/CALA-Morrison to take up the Plaza Phase 1b and building commenced in June 1998. Standard Life eventually bought out the land and buildings of Phases 1b and 1c. A summary of completion dates, current occupiers and, where known, owners, is given in Table 8.

[14] Within strict time limits. The first limit expired in June 1997 and CALA- Morrison applied for an extension. Development of Phase 1b started in June 1998.

## Table 8. Site Development, The Exchange

| Address | Current Occupier | Owner | Net Area ($m^2$) | Completion date |
|---|---|---|---|---|
| Saltire Court, 20 Castle Terrace | Various | | 14,152[1] | 1991 |
| 4, Rutland Court | Baillie-Gifford | | 4,085[1] | 1991 |
| Conference Centre | EICC Ltd | City of Edinburgh Council | 11,214[2] | 1995 |
| Conference House, Morrison Street | Various | City of Edinburgh Council | 3,382[1] | 1995 |
| 30, Lothian Road | Standard Life | Standard Life | 26,594[1] | 1996 |
| Clydesdale Bank, 50 Lothian Road Plaza | Various | British Railways Pension Fund | 8,825 | 1997 |
| Scottish Widows, Port Hamilton | Scottish Widows | | 31,115[1] | 1998 |
| Exchange Crescent Ph 1b | Standard Life | Standard Life | 10,776 | 2000 |
| Exchange Crescent Ph 1c | Standard Life option | Standard Life | 9,095[1] | U/c 2000 |
| Conference Square/Morrison Street | Scottish Widows | | 5,016 | 2000 |
| Capital House | Various | BriTel | | 1985 |

Notes. 1. The primary floorspace data is GFA. NFAs were estimated assuming a 15% recirculation area.
2. GFA not strictly offices.

## CLOSING REMARKS

### The City as active landowners and the triggers for development

In their own way, both of these developments were the products of a new commercial attitude that emerged in the City of Edinburgh Council in the early to mid 1980s (although, as noted, both had their roots in the late 1960s and early 1970s). About this time the city adopted a role of leading development which went beyond its traditional role in the development process. This saw the Council involved in the development and regeneration of a number of key City locations in partnership with both the public and

private sectors. Importantly, there had been a recognition that the City had a duty to provide land for commercial development (Wall, 1998). There was a demand for large-scale office development and the City of Edinburgh Council recognised a responsibility to assist in development for the long term economic good of Edinburgh. This represented the main motive for development for both of the schemes although in the case of the Exchange an additional incentive was to provide an international conference centre.

Land availability and the willingness of the landowner (The City) to develop their land were important factors in both developments. However, land had been held for some time before development plans originated (the Exchange land had been in the City's possession since 1967 and their land parcels in Edinburgh Park since the early-1970s). Actual development was triggered by a number of factors. These included:

- A recognition that planning policies with respect to commercial office development had caused a serious restriction in supply that was affecting investment in the City. The City's Economic Development team had recognised that the City had a duty to provide land for commercial development.
- In the case of the Exchange, the final abandonment of controversial plans to construct an inner ring road that had previously depressed the wider West Central Edinburgh area.
- In the case of Edinburgh Park, the willingness of other landowners (Wimpey, M&S and ASDA) to participate in a wider development scheme. This was crucial. These owners gave up their freehold rights in land in return for the opportunity to participate in a wider development, *supported by the City*

*planners,* which would bring significant business to the South Gyle area. There is some evidence that ASDA and M&S may have actually originated the proposals to develop the whole of the South Gyle area beyond the existing industrial estate.

- The realisation by the City Council that it was not ultra vires to the Local Government (Scotland) Act, 1973[15] for it to borrow against the value of leases granted on its land holdings. This allowed the City to take a much more proactive role in the development of its land that was less dependent on the private sector. It could, and did, invest monies in Master Plans and initial infrastructure to encourage development. This almost Keynesian approach was carried out at a time when a strict monetarist policy was being exercised in Central Government with severe spending limits on Local Government. Part of the rationale for setting up both Enterprise Edinburgh and EICC Ltd was that it enabled the City to raise money on the capital markets against such leases. Capital was raised against the value of a lease, which was in turn largely determined by the use to which the land would be put. It was in the City's interest to develop its land portfolio to increase its borrowing capacity, although the motive was regeneration and development of its land portfolio rather than simply cash generation.

---

[15] Section 94 of the Act relating to Capital Expenditure "It shall not be lawful for a local authority to incur any liability to meet capital expenses except with the consent of the Secretary of State, and the Secretary of State may, if he thinks fit, give his consent for the purposes of this section-

i. Subject to such conditions as may be specified in the consent;

ii. In relation to such project, or to such programme of works, or to such class of works, or to such amount, as may be specified;

iii. In relation to expenses to be mat by the authority within such financial year as may be so specified"

## Influence of Local and Regional Plans

There is no question that the policy watershed of the 1985 LRC Structure Plan with respect to office development gave legality to the Exchange and Edinburgh Park developments. The evidence is, however, that discussions concerning these developments preceded the Structure Plan. In the case of Edinburgh Park there is evidence that this may have been by as much as two years. In this case, the Economic Development Team in the City appeared to be working at arms length to the planners and may have persuaded the letter to change policies post hoc to their discussions with M&S, Wimpey and ASDA. In the case of the Exchange, the statements in the Structure Plan reflected the final scheme fairly closely, which indicates that some thought had been given to the latter prior to the Structure Plan. Thus the overall impression is one of the 1985 LRC Structure Plan lending legality to on-going discussions rather than driving new development although there is no question that this was required before development could proceed.

## Role of the Market and Property Professionals[16]

In both cases, property professionals have been used to market/promote the individual buildings in the development schemes. It is probably true to say, however, that their overall role in the developments has been low key. Their role has been more important in Edinburgh Park than the Exchange since more speculative building has taken place in the former. Even in the Park, however, occupiers have been found fairly quickly because of the prestigious nature of the development. It is true to say, however, that property professionals have given advice on market conditions and given the respective

[16] This term is used to refer to professionals within firms of Chartered Surveyors and property consultants.

developers confidence in starting new builds. In this context, in the case of Clydesdale Bank Plaza for example Ryden International Property Consultants (Thompson, 1998):

- Advised EICC Ltd on the timing of the release of their land to the developer CALA-Morrison.
- Pointed out the opportunity to CALA-Morrison.
- Advised CALA-Morrison on long term funding for the development (full forward funding from British Railways Pension Fund).
- Assisted with letting.

These kinds of role appear to be typical. In broad terms property professionals have played an advisory and linking role between the City and the market. Largely speaking, however, there is no evidence to suggest that they have either triggered development or, in the main, determined the timing of the development/the release of land to developers. Thompson (1998) notes that in the case of Clydesdale Bank Plaza, as soon as land was available the development went ahead on the assumption that the building could be let when completed. It could be argued, however, that the timing of the original release of land by EICC Ltd was determined by the latter's own perception that the time was right, together with the advice by Ryden that the scheme would work. Professionals have an important advisory role but in these cases they have not determined new development either in a spatial or, largely speaking, a temporal sense.

With respect to the impact of market economics on the developments, it would be unwise to suggest that broad economics has not influenced the timing of the developments (Donaldson, 1998, supports the view that whereas the City of Edinburgh

Council had the vision to promote new office development, the market determined the timing). However, it is dangerous to view the mechanisms for development simply in terms of economics driving rents, which in turn drives new development. In the first instance, the evidence suggests that a lack of office supply was more important rather than a clearly identified demand in driving development. In addition, the Chapter has outlined other non-economic factors, not least the attitude of personnel in the City of Edinburgh Council, which particularly influenced the trigger and timing of development. Importantly, however, in the final analysis, it was these agents who attempted to encourage demand within the context of a balanced economic development strategy and assisted in the provision[17] of land and commercial property to meet that demand.

[17] The City of Edinburgh Council is the largest landowner in the City.

## REFERENCES

Adams, D. 1994, *Urban planning and the development process.* UCL Press, London.

Ambrose, P. 1986, *Whatever happened to planning?* Methuen, London.

Anderson, D. (2000). Private Communication.

Associated Dairies, M&S plc, Wimpey Holdings and the City of Edinburgh District Council. December, 1985. *Maybury Park, Edinburgh.* Supporting Literature for Planning Proposals.

Birrell, G.S. and Gao Shi Bin. (1997). RICS Cutting Edge Conference.

Carsewell, A. (2000). Private Communication.

Cameron, D. (1987). West Edinburgh Shopping – A report to a meeting of The City of Edinburgh District Council Planning and Development Committee. 12 February.

The City of Edinburgh District Council. (1985a). Press release, 5 December.

The City of Edinburgh District Council. (1985b). *The South Gyle Area: A Strategy for its Future Development.* Draft NW Edinburgh Local Plan Supporting Statement.

The City of Edinburgh District Council. (1988). *Maybury Business Park.* Letter from The Department of Economic Development and Estates. Undated, believed to be 1988.

The City of Edinburgh District Council. (1992). NW Edinburgh Local Plan.

Cousins, M. (1995). *Calibrated Complexity.* Prospect – The Quarterly Journal of the Royal Incorporation of Architects in Scotland. **57**, p13

Donaldson, B. (1998). Private Communication.

EDI News Issue 2 1997

Edwards, B. (1989). *Meier's Maybury Master Plan.* RIBA, September.

Egi Archive. (1994). *Breaking the Mould.* Estates Gazette Focus, 12 March.

Egi Interactive (2000). Deals Information

EICC Ltd. (1997). Annual Report and Accounts.

Fisher, P. and Collins, A., RICS Cutting Edge Conference, 1997.

Healy, P and Barrett, S.M. 1990, Urban Studies, **27**, pp89-104.

Langford, L. (2000). New Edinburgh Ltd. Private Communication.

Lothian Regional Council. (1985). Structure Plan.

Lothian Regional Council. (1994). Structure Plan.

Meier, R. (1991*). Maybury Business Technology Park: The Overall Plan Proposed by Enterprise Edinburgh.* Archived by the Central Edinburgh Library in August 1991 but possibly produced late 1990.

New Edinburgh Ltd. (1995). *Edinburgh Park Update.* Journal of the Royal Incorporation of Architects

New Edinburgh Ltd. (1999) Edinburgh Park News, Issue 9, June.

The Scotsman. (1993). *Office Park with the Stamp of Quality.* 8 June.

Spence, I. (1995). *An exchange of ideas.* Prospect - The Quarterly Journal of the Royal Incorporation of Architects in Scotland. **57**, p10.

Thompson, G. Ryden International Property Consultants. Private Communication, 1998.

Wall, I. (1998). Private Communication.

Wilson, M. (2000). Private Communication.

CHAPTER 8

# Systems, change and the office market in Edinburgh:

# Conclusions and recommendations

## INTRODUCTION

The work described in the preceding chapters has offered an alternative explanation of the structure and behaviour of the commercial property market based on systems theory. It has placed this interpretation in the context of existing models of the market and has offered a mechanism for change based on the concept of complex adaptive systems arising from general systems theory. It has tried to place property market research on an equal footing with concepts being developed and applied in evolutionary economics and with ideas of self-organisation being used in the study of the way cities change and develop. It has been particularly interested in the commercial development process, which forms part of the overall property market process. In this context, it has taken new ideas from other disciplines and applied them for the first time to the commercial property market in order to understand the way in which the market we see today has developed. It is not possible to even begin to understand change until some definition of the system itself and its components are made and the structural diagram presented in Chapter 4 was undertaken with this in mind. This structural analysis combined with ideas from general systems theory allows a start to be made in analysing future change based on the interaction of micro-diversity in the system components with the system environment.

The work has made a distinction between the terms systems dynamics and systems theory as applied to complex adaptive systems. Systems dynamics describes the mutual interactions of the actors present in a system. These interactions may be described by a systems structure diagram and by a set of systems dynamics equations. In this sense there appears to be little difference in principle to economic models, which use a series of equations to describe the same thing. Systems dynamics, however, does add another dimension to this type of conventional modelling. Thus an initial systems dynamics analysis can provide crucial leads into the types of interactions that ought to be considered in any mathematical model (through the systems structure diagram). In this way it serves to orientate the analyst to the data. Importantly, however, it forces an analysis of the system dynamic and as such provides a deeper understanding of the important interactions. The structure diagram described in Chapter 4 begins that process for the mainstream economic system. It has focussed much of the subsequent study in the thesis and ultimately forced a reinterpretation of behaviour in the Edinburgh office market (see later).

The concepts of general systems theory and complex adaptive systems, discussed in Chapter 3, try to go beyond this descriptive approach and add to it in a mature way. System dynamics does not explain why the structure is there and how it might adapt. Rather it provides a snap shot of current interactions. It has no way of producing new objects, new variables and the predictions arising from the systems dynamics equations will only be true until some moment, unpredictable within the model, where there is an adaption or innovation and new behaviour emerges. Importantly, the concept of open, adaptive

systems offers a way of analysing change and it is in this sense that systems theory is so important and adds to existing descriptions of the market.

In practical terms the work has undertaken a major study of the commercial office market in Edinburgh in order to understand current market dynamics, confirm structural links and to identify micro-diversity in behaviour which might lead to future structural change. Irrespective of the success of the latter this practical market study has produced stand alone results of use to a range of practitioners in the property market in Edinburgh and has highlighted the way in which driving forces other than purely economic ones might influence market development. The analysis illustrates the point that an interpretation of local markets simply in terms of the economic cycle can mask more complex behavioural issues. The behaviour of the market, although influenced by broad economic conditions, has by no means been solely determined by them. The overall picture is one of complex dynamic interaction. Importantly both the theoretical and practical strands to the work highlight the importance of understanding the link between the market in which ownership and occupation are separate and the owner/occupier market.

This Chapter now attempts to pull some of these strands more closely together and present an alternative interpretation of the Edinburgh office market over the last ten or so years.

## A STUDY OF SYSTEMS

### One Model of Reality - The Property System

The systems work has been carried out on a number of levels. In the first instance a simple systems structure diagram for that part of the commercial property system in which

ownership and occupation are separate has been outlined in Chapter 4. This was produced to illustrate the way in which systems theory and systems structures could be used to aid understanding. Although it reflects a mainstream economics view of market operation, importantly it attempts to reflect the dynamic of the system (lost in other models of the market) using the principles of dynamic feedback. The work on the Edinburgh office market discussed in Chapters 5, 6 and 7 confirms and refines the structural links outlined in the structure diagram (see also below).

The recognition of an underlying system structure is the first step towards understanding behaviour. In a sense this is recognised by existing models of the property market which describe the structure in a variety of ways (see Chapter 1). Mathematical/econometric models simplify the factors and interactive forces at work in pursuit of a reductionist mathematical description of behaviour whilst institutional and event sequence models describe the market and the associated commercial development process in qualitative terms and encompass a wide range of factors and behavioural forces. Ball's structure of provision approach seeks to identify different institutional, financial and legislative structures for different types of development. Reality reflects aspects of all of these approaches and no one type of model can be said to be unifying. However, implicit in many of these approaches is the concept of the property market as a system although the market and the associated commercial development process has never been formally conceptualised as such nor analysed in systems terms. Healey and Barrett (1990, quoted in Adams, 1994, p65) note the continuous interaction that takes place between structure and agency and the need to reconcile this interaction. There are also echoes of the systems

approach in the structures of provision approach which, incidentally, suggests that structures will change as a result of factors such as 'market pressures', changes in technology etc. In addition, almost without note, many existing approaches recognise exogenous and endogenous influences on market behaviour and by implication a boundary surrounding the 'market system'.

There is, however, a fundamental distinction between econometric/statistical models, which are limited in terms of their usefulness in analysing the underlying dynamic of market processes, and other models, which attempt to provide more comprehension and explanation of the changing character of property markets[1]. This distinction is at the heart of the current debate in property research that argues that the goal of property research should be more than prediction. There is a strong case for work that provides more comprehension and explanation of the changing character of property markets. By omitting an explicit treatment of physical property and property market process, conventional analysis of urban economic activity and change provides an incomplete explanation of restructuring and adjustment in the urban economy (D'Arcy and Keogh, 1997).

In this context, Guy & Henneberry (2000) have critically reflected on institutional approaches to the commercial development process in order to develop a research framework which blends economic and social analyses of the process. They argue for a perspective which views the economic and social as two interrelated aspects of a wider

[1] Although many of them are no more than sketches or descriptions of actors and market behaviour.

process of urban change in which structure and action are "recursively linked" (Chapter 2). They suggest that research should start to develop an analytical technique that is both qualitative and exploratory, and that is attentive to both structure and agency. They also suggest that this perspective [should] avoid models of development behaviour which presume the "character of human reasoning and rationality...[to be]...uniform...corresponding to a model of individual, rationalist self-interest" (from Shackley, 1996, p215 quoted in Guy & Henneberry, 2000, p2413). In contrast, the view of the property process should be "dynamic, deeply contextual and contingent both on the particular aims and objectives of development actors and on a shifting market framework which may enable or constrain development strategies". It also recognises the interrelationships between structure and agency and notes that such an approach "reconnects the social and the economic.....and allows us to explore how the property market is constructed by competing design, development and investment actors at local, national and global levels and over time" (p2413). These kinds of distinctions can be seen in the analysis of 'neo-institutional and institutional cities' by Lambooy and Moulaert (1996).

A similar approach lies at the heart of this study, which suggests that systems theory offers a route to reconciliation. It offers a formal methodology for unifying these themes and an alternative vehicle for examining the development process. Economic systems such as the property market are imbued by cultural values and underpinned by social and psychological customs that influence the way in which people understand their options and make their choices. The advantage of the systems approach is that it can address and integrate this

diversity and offers a multi-dimensional framework in which information from different disciplines and domains can be integrated (Clayton & Radcliffe, 1996). It can incorporate actors, process and economic structures into one structure diagram and offers a way of reconciling the duality of structure and agency with the dualism implicit in the approach (cf. Ball 1998 where such issues were resolved by incorporating organisations and markets in the relevant structure of provision).

Development concerns particularly the emergence of new spatial organisation, new activities and behaviours and the structures that these lead to (Allen, 1997). Importantly the systems approach has the ability to relate property market processes to this wider concept of development through hierarchical control. The property market process, and with it the commercial development process, is a component with internal structure (a sub-system) within a wider system that incorporates the changing structure of cities, regions and nations and the process of urbanisation. The spatial development process operates through the provision process and is one part of the decisions process which is impacted on by other factors in the urban system e.g. existing spatial distribution, transport infrastructure, the local economic situation and so on, but not just by the macro economic situation.

**Systems Theory and Change**

On a second level the systems approach provides a methodology to understand change based on ideas of configuration entropy and complex adaptive systems.

A common fault of all the models, including the systems model described in Chapter 4, is that they describe existing market structures on a post hoc basis. In this context, it is

important to recognise that there is another stage in understanding. Market structures might change. Indeed systems theory suggests that they *will* change and suggests that within a system, at any given level of complexity, there are emergent properties which cannot be readily explained solely by reference to lower levels (structure). The understanding of this type of structural change is crucial if we are to predict future behaviour. In the short term (until the structure changes) it is possible to use system dynamic equations to describe the mutual interactions of the actors present. These encompass and attempt to describe and understand a wider interaction than the reductionist approaches. Systems dynamics does not, however, explain why the structure is there and how it might adapt. It has no way of producing new types of objects, new variables. The prediction that it generates will only be true until some moment, unpredictable within the model, where there is an adaptation or innovation and new behaviour emerges (see Allen, 1997, p5).

In tackling and describing these issues the work has drawn on a body of knowledge largely ignored in property research and has refined it for the purposes of understanding property market behaviour. In doing so it has highlighted the need to place property research on a par with cutting edge studies in modern evolutionary economics and with studies of self-organising systems. Studies of the property market have not got beyond first base in conceptualising the market and the development process as a system with systemic qualities let alone considering how it evolves and adapts to its environment and how this evolution may be described. It is in danger of being left behind by these related disciplines, which are moving beyond an analysis simply based on equilibrium economics.

In this context, recent work on evolutionary and self-organising systems, is beginning to address the issue of change and the modelling of change. Systems can adapt and change as a result of *self-organisation* (the adaptive response of a system to changing external conditions) and/or *evolution* (the evolutionary response on the part of the system's components). Modern evolutionary economics recognises that understanding change is fundamental to understanding present behaviour (Andersen, 1996), and the work of Allen (1997) on self organising systems, explores the way in which urban and regional structures evolve and change as a result of the multiple decisions of the inhabitants. Such work is firmly founded in general systems theory and concepts of configuration entropy and the idea **of non-equilibrium structural change** based on the interaction of micro-diversity[2] in system components with the environment across an open systems boundary. Allen (1997) contrasts this accommodation of individual goals and preferences, and their diversity, with the equilibrium approach. In the latter it is supposed that the collection of individuals within the system somehow make decisions in such a way as to drive the system to equilibrium i.e. to some changing condition which expresses some collective. This vision of equilibrium with individuals and organisations having clear responses to events that are perceived with absolute clarity is not one that normal people would recognise as corresponding to reality.

[2] In this context, micro-diversity in preferences for renting, the behaviour of landowners (active and passive), lease patterns and occupier demand are all driving forces for change and represent areas of further work to establish whether this micro-diversity is sufficiently strong to precipitate a change in market structure.

Changes in market structures will inevitably impact on the description of the market and any predictions that arise therefrom. In order to model change we must try to understand and model the evolutionary tree of successive structures (Allen, 1997). In this context, historical studies of the type undertaken by Scott (1996) and Powell (1996) and analysed in Chapter 4 are important. This details a process of change in the UK property market stretching over a period of almost two hundred years and describes the transformation of property from a *'social institution to a financial asset'*. The analysis in Chapter 4 interprets this change in terms of a mechanism based on the interaction of the system environment with the inherent micro-diversity in system components. Thus the increasing involvement of the institutions and the associated structural change in the market is consistent with a systemic response to changing external conditions, including inflation and the rapid sociological changes which occurred in the 19th Century.

The present market and supply process has been shaped by the history of the market in the UK and the behaviour of the actors within it. The structure diagram presented in Chapter 4 is one adaptive 'solution' for the property market in the UK to date. It reflects the preference for leased property and in a sense it is part of a more inclusive system which includes the owner/occupier market. There are interactions between and within the respective systems (explored in Chapter 6) that influence the way in which both markets develop and the preferences for one or other type of occupation. If truly adaptive systems are to be described these relationships cannot be divorced. Such representations, however, are impossible without dynamic studies of market behaviour and the study of the Edinburgh market was been undertaken with this in mind.

## Summary of benefits

The benefits of the systems approach as applied to the property market may be summarised as follows:

- It offers a formal methodology for unifying the themes of existing market models as well as providing an alternative vehicle for examining the development process.
- It has integrated agents into a structure that reflects the cause, process and effect of the mainstream economic approach and which could, if desired, integrate social and cultural aspects of actor behaviour. As such, it offers a way of reconciling the duality of structure and agency with the dualism implicit in the latter approach. The actors and components of the system **are** the structure and are part and parcel of the determinants of present and future behaviour.
- The approach allows a better definition of exogenous and endogenous factors through the definition of a system boundary that incorporates land.
- It addresses a common fault in the mathematical, events sequence and structure and agency models of the market as described in as much as it attempts a dynamic analysis. Hitherto, descriptions of the market have been 'static' and generally do not describe feedback. They may indicate market relationships or stages in the development process (a flow diagram e.g. in the case of ad hoc institutionalism, see Ball 1998) but do not, in general, accommodate the feedback responses that may alter the decision making process on a continuous basis.
- It recognises that there may be a web of inter-dependencies that determine behaviour (through the feedback loops) and that a component can often, in practice, operate both in a control function and in a dependent function. Understanding these

offers a way of analysing the relationships that generate behaviour rather than just correlating the factors that *influence* performance.

- It offers a real worldview, based on an open system approach that integrates information from different disciplines and domains in a multi-dimensional framework.
- It offers a sound methodology for understanding change based on the open systems approach, configuration entropy and non-equilibrium structural change.
- It highlights the need for local studies. Agents (individuals and organisations) can never be perfectly informed and they have (at best) to optimise locally rather than globally.
- It addresses the contention (Ball, see Chapter 2) that structural change cannot be greatly affected by agency behaviour through the notion that micro-diversity in the components of the system (including the actors) can interact with the system environment to bring about change.
- It offers an holistic view of market operation which goes beyond reductionist descriptions of market processes.

## THE OFFICE PROPERTY SYSTEM IN EDINBURGH

### The Edinburgh Office Study and its Impact on Structure

The Edinburgh office study examined the local Edinburgh system in detail with particular reference to the provision of office space. In keeping with the philosophies outlined above, an important element of the work was to generate a broader understanding of market dynamics and a better comprehension of the changing character of property markets. It

attempted to go beyond a simple economic analysis of the circumstances within which the market operates; in particular; it aimed to develop a better understanding of the dynamics of office provision in Edinburgh and to develop a better understanding of the interactions between actors.

Although the Edinburgh office market is relatively small compared to London and some English regional centres, it is attractive in the sense that it is local as well as being the second largest financial centre in the UK. Chapter 4 argued that the size of the market does not necessarily change the behaviour patterns of the actors, although it may more finely attune them to market signals compared to the situation where development and investment transactions occur on a frequent basis. In addition, the study of a less complex system is worthwhile at this stage in the understanding of systemic behaviour in the property market.

There were three main strands to the work:

- The contextual studies in Chapter 5 investigated the pattern of new office build and change of use in the Edinburgh office market over the chosen timescale and placed the dynamics of this provision process in the wider economic and social context.
- The intensive studies described in Chapter 6 examined the behaviour of occupiers and the impact of market signals on property decisions through a detailed market survey. Time limitations precluded a detailed study of investment and developer behaviour although the latter has been examined in the case studies, which represent the third strand of the work.

- The case studies described in Chapter 7 examined the two major office developments in Edinburgh over the period of the study, Edinburgh Park and The Exchange. They were particularly interested in parts played by particular agents in the development process (including The City of Edinburgh Council, property developers and other property professionals). They also examine the motives and trigger for development.

These three strands represent perhaps the most detailed study of the Edinburgh office market ever carried out and notwithstanding the relevance of the work to the systems dialogue they represent stand alone result of wide applicability to property professionals. They illustrate the changing role of Edinburgh's New Town and the development of new financial districts at the Exchange and the South Gyle Parks and the continuing evidence of a dynamic interactive office market in Edinburgh. Within this framework, the City appeared to have a vision of what it actually wanted in terms of commercial development, attempted to encouraged demand within the context of a balanced economic development strategy and assisted in the provision of land and commercial property to meet that demand. It is arguable that this involvement has reduced market volatility and has moderated the worst excesses of speculative development, particularly post 1990.

The market, per se, appeared to have its greatest influence on the behaviour of the period property in the Edinburgh New Town. Here changing preferences for open plan office space impacted on change of use of period buildings to offices (the traditional source of office space in Edinburgh) and on the market in existing office space in the New Town. The wholesale restructuring of this market was moderated, however, by the availability of other space and existing leases.

In this overall milieu, it can be argued that trends in new build resulted as much from the trends in land supply as the general economic conditions obtaining and were influenced by the rolling provision of land by the City. In this context, the 'three ring circus' view of the market/development process with rent as a transmission mechanism between occupier demand and new development, reflected in the systems structure diagram in Chapter 4, is misplaced. In the case of the Edinburgh market since 1990 the structure diagram outlined in Figure 8.1 is more representative of the dynamics resulting from the participation of the City Council.

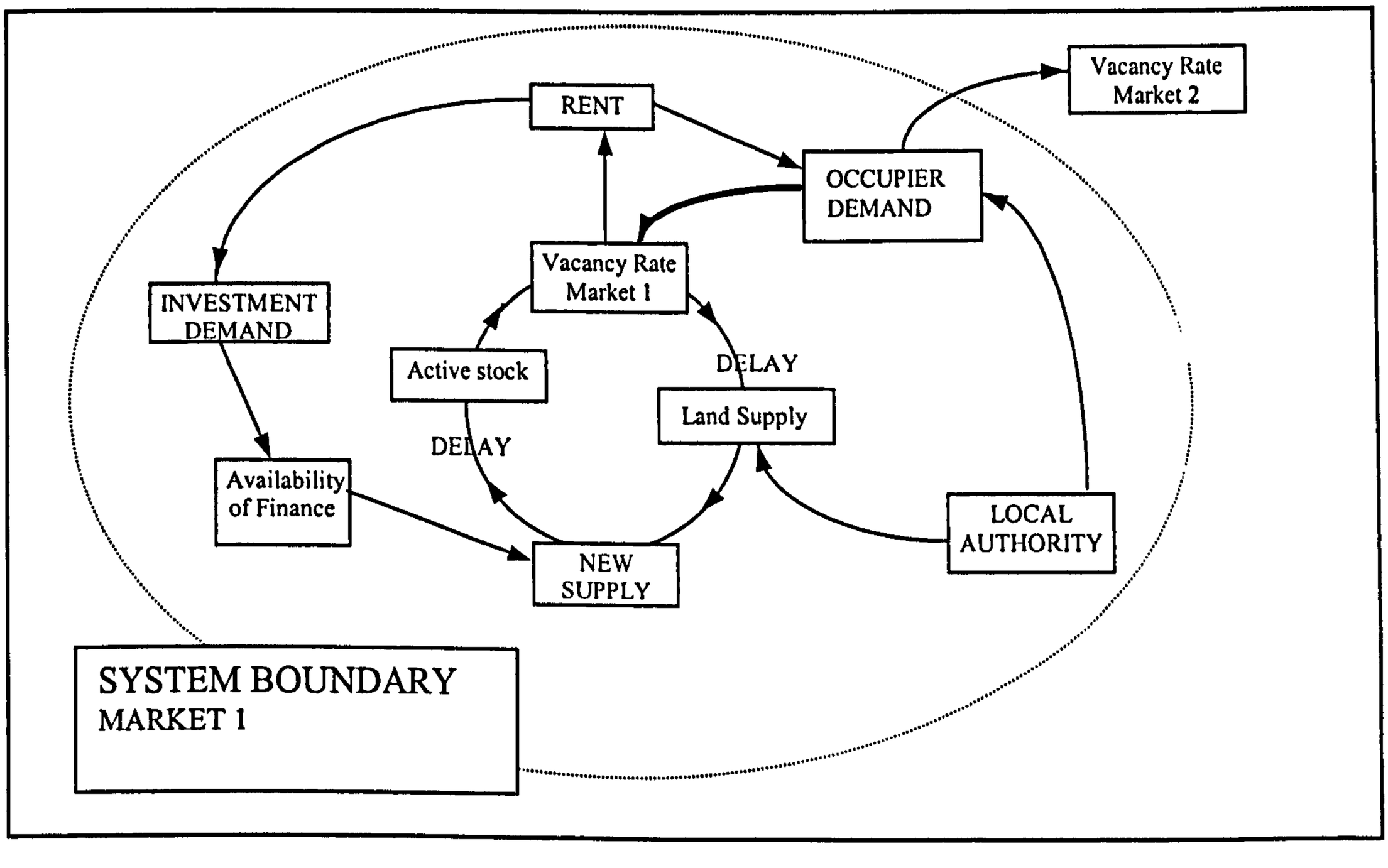


**Figure 8.1. The post-1990 dynamics of City participation in the development process**

The structure diagram demonstrates an alternative interpretation of market behaviour over the period of the study. It is representative of over 40% of all new build in Edinburgh over the period of the study and, although in this sense it is not definitive, it demonstrates the

complex nature of local markets and what can be lost by adopting a purely economic view of behaviour.

In support of this view, the contextual studies confirmed the extent of City involvement in new development (progressively from the late 1980s). They also, incidentally, demonstrated that in the case of office parks, rents were unaffected by the recession in the 1990s, further evidence that macroeconomics does not always drive market behaviour. Both the contextual evidence and the case studies confirmed the links between land supply and occupier demand and the importance of considering the links to other sub-markets when considering overall market behaviour. The latter is evidenced by the impact of new office development in the City centre on change of use to offices in the Edinburgh new town and by the interaction of office rents in the New Town, modern City centre offices and Edinburgh Park rents.

The studies have also clearly indicated the impact of land release on the overall kinetics of new development and the important part that the City played, as an active landowner, both in the co-ordination of land use and its release to the market. Land release is shown as being influenced by vacancy rate on the basis of evidence from the case studies, particularly that from the Exchange scheme. Vacancy rate is also shown as influencing rent. However, based on case study evidence, rent is not included as a direct determining factor of new development i.e. factors other than rent, in the main, prompted new development. Rather, it is shown as having an indirect effect through the provision of finance via investment demand.

The City of Edinburgh Council is shown as influencing both occupier demand and land supply. Interestingly, the evidence from both the contextual studies and the case studies was that the formal planning system played no lead roles in these processes. Development was lead by EDI and the economic development team in both cases. The planners were also rans. The evidence was that new development was being driven by the landowners involved. Strategic decisions in Structure Plans were formed by these groups before being confirmed by the planners in the structure plan and through the relevant planning committees.

As previously, rents are shown as influencing occupier demand in the market in question (so called market 1) and through this route it influences choices in that market and the decision to participate in that market or another (market 2). This is based on clear evidence from the occupier survey that price is an important determinant of choice and that price is much more elastic than received wisdom would have us think. Not only does price influence decisions on particular buildings and markets within the overall leasehold system but the evidence is that it influences the basic decision to own or rent. So, not shown on the diagram, but illustrated in Chapter 6, are the complex price links between the owner occupier market and leasehold markets – surely an area for further work. What are also omitted are the other preferences (e.g. location) which will also influence this choice. In this context, the survey represents only one of two identified studies to examine the relationship between owner occupation and leasehold occupation. It highlights not only the extent of owner occupation in the Edinburgh market (40%) but also the need for further work to examine the links to the leasehold market in general.

Unlike the structure diagram given in Chapter 4, land supply is firmly placed within the system boundary on the basis of the case study evidence and that from the contextual studies.

What the diagram does not show (cannot show) is the variety in patterns of occupation, particularly lease length, evidenced by the occupier survey described in Chapter 6. This confirmed a pattern of shortening in lease lengths seen elsewhere and perhaps more significantly in terms of change, the micro-diversity in behaviour. The survey also confirmed the importance of market intermediaries in the system as links between the factors and components of the system.

**SIMULATION**

Chapter 3 has noted that much of the strength of systems dynamics comes from its ability to be used in simulation models for quantitative simulation to support policy design as well as qualitatively to portray the workings of a system as an aid to thinking and understanding. It was noted that simulation should not be interpreted necessarily as predictive modelling. Rather it allows an analysis of the overall behaviour of the system for understanding and policy considerations. The systems simulation outlined in Chapters 3 and 4, however, represent only the first level of simulation. At this level, simulation is, in a sense, a sophisticated reductionism. It allows for and describes feedback and can accommodate non-linear dynamics. Nonetheless it still reflects the traditional approach of physics, which is to identify the components of a system and the interactions operating on these, both to and from the outside world and between the different populations of the system (see Allen, 1997, p5).

At another level it is possible to simulate self-organisation by adding noise to the variables of the system (to the deterministic equations of systems dynamics). This noise can search out different spatial arrangements which may be stable under the new conditions (non-linear interaction with changing external conditions brings about self-organisation –see Allen, 1996 p7). However, in order to reach the highest level of simulation whereby evolutionary structures that change through time and which produce evolutionary trees of structures it is necessary to add true micro-diversity to the components. This must represent one of the major goals of research in this area for the future. In the final analysis, however, Allen notes that:

> *"We cannot really predict, but we can explore possible futures, and can help to imagine some of the properties of these. We can possibly assign some level of probability to different paths into the future, but nevertheless we must also admit that new situations may well open new dimensions of behaviour and experience so that we can never obtain a complete picture of a particular path.....in reality we can never vanquish uncertainty about the future.....because we recognise this we must therefore urge that policies should reflect this uncertainty and always allow diversity and redundancy in the system to allow for future adaptations to the emerging reality".*

There is a maturity and depth to this kind of view that is totally lost in many economic and non-economic models of the property market, including the systems model as presented in this work. At the heart of it all is understanding change and property research should, like

the new economics and recent studies of urban systems before it, begin to address and tackle the difficult concepts involved if it is to truly understand behaviour.

## RECOMMENDATIONS FOR FUTURE WORK

The work described here has really only just begun redefining behaviour in the property market in systems terms and theoretical aspects need to be developed further. The main bulk of the recommendations below, therefore, are in this systems context. Some of these are related to the extension of systems theory as it might be applied to the property market and some are related to exploring further structural links and micro-diversity in behaviour since these impact significantly on change.

### Specific recommendations

1. It is recommended that the structural links between the owner occupier market and the leasehold market are further explored and the implications with respect to behaviour in the leasehold sub-system better defined.
2. The concept of change needs to be better defined in theoretical terms with specific reference to micro-diversity in property market components and their interaction with the external environment. This could include a more detailed study of the interaction of micro-diversity in landowner behaviour with external factors such as inward investment and occupier demand and its impact on structural change. It could also include a more detailed study of the implications of shorter lease lengths on investment behaviour.
3. The study of occupier behaviour in the Edinburgh office market needs to be supplemented by similar studies of investor and developer behaviour.

4. A more detailed assessment of the links from occupier demand to vacancy rates in the systems diagram would be of some use. This should examine whether take up rate is more appropriate as the linking factor.
5. Market intermediaries need to be better incorporated into the system diagram. This requires a detailed study of the role of intermediaries in market processes.
6. This work has only laid out possible simulation routes in the barest of terms. The work needs to be taken forward, particularly with respect to the incorporation of micro-diversity into simulation models and potentially the parachuting of 'events' into time series simulations.

## REFERENCES

Allen, P.M. (1997). *Cities and regions as self-organising systems: Models of complexity.* Gordon and Breach.

Andersen, E.S. (1996). *Evolutionary Economics – Post Schumpeterian contributions.* Pinter, London.

Ball, M. (1998) Institutions in British property research: A review. *Urban Studies*, **35(9),** 1501-1517.

Clayton, A.M.H. and Radcliffe, N.J. (1996). *Sustainability-A Systems Approach* Earthscan, London.

Coyle, R.G. (1996). *System dynamics modelling: A practical approach*. Chapman and Hall, London.

D'Arcy, E and Keogh, G. (1997). Towards a property market paradigm of urban change. *Environment and Planning A*, **29** 685 - 706.

Guy, S. and Henneberry, J. (2000). Understanding urban development processes: Integrating the economic and the social in property research. *Urban Studies*, **37(13),** 2399-2416.

Healey, P. and Barrett, S.M. (1990). Structure and Agency in land and property development processes: some ideas for research. *Urban Studies*, **27**, 89-104.

High Performance Systems Inc. (1997). *An introduction to systems thinking.* Introduction to *ithink* software package.

Lambooy, J G. and Moulaert, F. (1996) The economic organisation of cities: An institutional perspective. *International Journal of Urban and Regional Research*. **20(2),** 217-237.

Powell, C.(1996). *The British building industry since 1800: An economic history*. Spon. 2nd Edition

Scott, P. (1996). *The Property Masters*. Spon. London.

Shackley, S., Wynne, b and Waterton, C. (1996). *Imagine complexity: the past, present and future of complex thinking*. Futures, **28**, 201-255.

**APPENDIX 1.**

# Mathematical models of property and building cycles.

**Terms used in the equations**

| | |
|---|---|
| a | Absorption |
| $c_s$ | Buildings let to new users on completion |
| $c_d$ | User demand |
| $d_t$ | Level of new building starts at time t |
| $d_d$ | New buildings ordered by the investor |
| $d_t'$ | Completed developments |
| E | Employment in the relevant sector |
| $\delta$ | Depreciation term |
| $K^*_t$ | Current level of desired stock |
| $K_t$ | The actual stock available |
| $K_{t-1}$ | The actual stock available from the previous period |
| k' | Constant |
| k | Constant |
| M | Future (manufacturing) output |
| n | Inflation |
| $O_s$ | Occupied stock |
| $Q_t$ | The user activity |
| q | User revenue of income |
| r | Rent |
| s | Total supply of capital |
| u | Input prices |
| $u_c$ | Construction costs |
| $u_i$ | Interest rates |
| $u_n$ | Inflation |
| $U_e$ | Unemployment in the relevant sector |
| v | Capital value |
| Vr | Vacancy rate |
| w | Yields obtainable from other long term investments |
| y | Yields from property |

## INTRODUCTION

In the main, studies have concentrated on the nature of building cycles both in the UK and the US. Research linking the level of economic activity to building activity and/or property performance ranges from simple descriptive accounts of the links between

building and business cycles to elaborate models for forecasting returns. Many of the equations used are not really structural equations in the systems sense. In general, they look at factors that influence performance rather than generate behaviour. In addition, they incorporate real time series data into models and where data does not exist use proxies[1]. For this, amongst other reasons, the review has not presented detailed equations for these models nor does it compare the accuracy of their predictions against real trends. There are, however, some common structural themes used in all models in one form or another and these ought to be noted since they impact on the systems model discussed later.

Generally speaking the theoretical basis of the models is derived from the accelerator or main stream economics equilibrium models (Key et al, 1994). There appears to be a consensus on stock adjustment-accelerator type models for building cycles whilst most 'structural models' of market process tend to model rent and development outcomes with multivariate time series regression.

## ACCELERATOR MODELS

The specific case of accelerator models of investment assumes that the level of net investment in capital goods is proportional to changes in the level of economic activity:

$$K^*_t = kQ_t \qquad (1)$$

and that:

[1] For example the demand for property is a derived demand. There is no direct measure of this demand so it is measured by proxy. The usual measures relate to output of, expenditure in or employment in the sectors of the economy relevant to the type of property under consideration (see Ball et al, 1998 p 198).

$$d_t = k'(K^*_t - K_{t-1}) \qquad (2)$$

Equation 2 represents the stock adjustment equation. Simple accelerator models assume that capital stock responds instantaneously to changes in output. So called flexible models allow for the lag in the adjustment of the actual capital stock towards the desired level. Both the accelerator and a lag are necessary for generating cyclical behaviour (Evans, 1969 noted by Key et al, 1994). Barras (1983) and Gardiner and Henneberry (1988) note that this simple view subsumes the link between changes in demand for space by users and the change in the level of space induced by the development industry. They suggest that the transmission mechanism is assumed to be along the lines of increases in demand leads to higher rents and capital values which raises the profitability of new development which influences the net level of development starts. Typically $Q_t$ is related to GDP for office rents.

Key et al (1994) identify six accelerator type models.

**Barras (1983).**

In this model of office development the lag between development starts and completions plays a key role in building cycles. Total construction starts are modelled as a function of actual new development, actual stock and depreciation, whilst existing stock is taken as a function of stock in the previous period and total construction starts.

**Bischoff (1970), Jorgenson (1971) and Nicholson & Tebutt (1979).**

These models use the accelerator mechanism to explain investment behaviour. In particular, Nicholson & Tebutt develop an econometric model of new orders for private

industrial building in the UK using a flexible accelerator model with lagged response. Manufacturing output was the most suitable measure of output.

**Wheaton & Torto (1990).**

These authors employ an accelerator type model to model industrial space in the US. This is a *single equation model* where future output and employment data sets are taken as proxies for $\mathbf{Q_t}$ and where new development is taken as a function of $Q_t$, interest and stock in the previous period. The equation (3) takes the form:

$$\mathbf{d_t = f(M, E, u_i, K_{t-1}, d_{t-1})} \qquad (3)$$

M and E are demand proxies (inserted in the equation as data sets)

**Barras & Ferguson (1987a and b).**

These authors develop a theoretical framework suitable for the dynamic modelling of cycles in each sector of the market (see below). The model incorporates an endogenous cyclical mechanism to reflect the long production lags in building activity and an exogenous influence on the building cycle based on variations in such economic factors as GDP and interest rates. The theoretical model comprises three equations for developer supply, user demand and investor demand. In the model the relationship between the supply of new buildings by developers and the demand for these buildings by users is mediated through the partly autonomous demand for property as a long-term investment by financial institutions. Institutions provide the link between the sub-markets ordering a quantity of new buildings, **d**, to be constructed at a price (capital value), **v**, and letting a quantity of completed buildings, **c**, to users at rent, **r** (see Barras & Ferguson, 1987a and b).

Rent is only one factor in the commencement of new development. If profit is considered to be the main driver for new development then other factors will affect it. Thus $\mathbf{d_t}$ will be a function of **v** (of the property to be developed) and input prices **u,** the components of which are construction costs, $\mathbf{u_c}$, interest rates, $\mathbf{u_i}$, and land prices $\mathbf{u_l}$ (see also; Ball et al, 1998) as follows.

$$\mathbf{d_t = f(v,1/u)} \qquad (4)$$

The quantity of new buildings ordered by the investor from the developer $\mathbf{d_d}$ and then let to new users on completion $\mathbf{c_s}$ are both dependent upon the yield ($\mathbf{y = r/v}$) and the yields which can be obtained from other long term alternatives, **w**; the level of investment supply and demand is also related to the total supply of financial capital, **s.** Thus:

$$\mathbf{d_d = f(r/v,s,w)} \qquad (5)$$

and

$$\mathbf{c_s = f(r/v,s,w)} \qquad (6)$$

User demand is likely to be an increasing function of user revenue or income, **q**, and a decreasing function of user cost of capital, in this case, rent i.e.:

$$\mathbf{c_d = f(q,1/r)} \qquad (7)$$

Manufacturing output and GDP were identified as 'good' proxies for the level of user activity, $Q_t$ (demand) in the industrial and commercial sectors respectively. The work 'confirmed' a relationship between the economy (GDP) and property cycles.

## MULTI-EQUATION MODELS

It is probably true to say that the theoretical model outlined by Barras (1987a) is typical of other property market models although the actual modelling technique, including proxies, may be different. A good many of these have relied on mainstream economic *multi-equation, accelerator/stock adjustment models*. These studies test demand, supply and rent adjustment equations using time series data and have led to a standard approach to the modelling of office markets (Key et al, 1994, Working Paper 2, p 13). Key et al (1994) and Ball et al (1998) identify a total of five such models.

**Rosen, 1984 and Wheaton, 1987.**

Demand is taken as a function of real rent and total employment in the finance, insurance and real estate sectors. A rent adjustment equation is used in which rent changes as a function of the deviation in the actual vacancy rate[2] from the average vacancy rate and the overall change in the price index. New office supply is expressed as a function of the lagged vacancy rate, expected rent, construction costs, interest rates and 'tax laws'. Rosen's behavioural equations take the form (8,9,10):

$$\mathbf{O_s = f(r, E)} \qquad (8)$$

$$\mathbf{\Delta r/r = f(V_r, u_n,)} \qquad (9)$$

$$\mathbf{d_t' = f(V_r, r, u_c, u_i, 'Tax')} \qquad (10)$$

[2] Vacancy rate simply expressed is the difference between the total stock and total demand expressed as a percentage.

Wheaton's equations take the form (11, 12,):

$$a = f(E, r, O_s) \quad (11)$$

$$d_t = f(r, V_r, K_t, E, u_c, u_l) \quad (12)$$

**Hekman (1985).**

Hekman specifies the level of rent as a function of the vacancy rate, real GNP, total employment and local unemployment rate. He then estimates the new supply of office space as a function of real rent (estimated from the first equation), construction costs, rate of growth of employment and interest rates.

$$r = f(V_r, \text{Demand Proxy}, E, U_e) \quad (13)$$

$$d_t = f(r, u_c, E, u_l) \quad (14)$$

The demand proxy in equation 13 was GNP.

**Wheaton, Torto and Evans (1997).**

These authors develop the model framework of Wheaton (1987) and apply it to the London office market (see Ball et al, 1998, p234). They use three equations for construction, absorption and rent adjustment which they relate to six endogenous variables (absorption[3], real rent, new construction, orders, vacancy, total floorspace and occupied floorspace) and three exogenous variables (nominal interest rates, office employment and real construction costs). These behavioural equations take the form:

[3] Absorption is the difference between occupied stock at time t and t-1

$$a = f(E, r, O_s) \quad (15)$$

$$r = f(V_r, a, O_s, r_{t-1}) \quad (16)$$

$$d_t = f(r, V_r, u_c, u_l) \quad (17)$$

**Hendershott et al (1997).**

These authors have produced a model for the London office market. Ball et al note that the most important difference from earlier models is a direct link to the capital markets through a time varying equilibrium rent derived from the conventional gilt yield. As with Wheaton, there are three behavioural equations (for development, absorption and rental adjustment). Seven equations link two exogenous variables (employment and interest rates) with six endogenous variables absorption, real rent, completed development, vacancy and total and occupied floor space. The behavioural equations take the form:

$$a/O_s = f(a_{t-1}, O_{s\,(t-2)}, \Delta r_{t-1}/r_{t-2}) \quad (18)$$

$$\Delta r/r_{t-1} = f(V_r, r, r_{t-1}) \quad (19)$$

$$d_t' = f(V_r, r, r_{t-n}) \quad (20)$$

## SINGLE EQUATION MODELS

A number of single equation models can be identified (Ball et al 1998).

**Key et al (1994).**

The work of these authors covered the occupier market as it related to rent, the development industry and new supply as well as a considering the investment markets. In the case of rents they modelled rental trends using simple *single equation* supply demand models which used a variety of proxies for supply and demand (e.g GDP as a

measure of demand for office space and construction industry statistics as a measure of new supply). Development activity was modelled assuming that it was a profit driven process and using rents and yields together with land costs, building cost indices and interest rates as measures of profit. Their work on the investment market produced a yields model which incorporated gilts yields, interest rates, inflation new construction and the amounts of net investment by UK institutions. Their rent and development behavioural equations take the form:

$$\mathbf{d_t = f(d_{t-1}, v, u_c, u_l, u_I)} \qquad (21)$$

$$\mathbf{r = f(r_{t-n}, Demand\ Proxy, d_{t-1}, u_i, K_{t-n},)} \qquad (22)$$

GDP was the demand proxy in equation 22.

A number of other single equation rent prediction model may be identified. (see Key et al, 1994 and Ball et al 1998). Ball et al note that published work on rent forecasting is limited, mainly because the models have commercial value. Of those that have been published they note that only one (that due to Key et al, 1994, noted above) incorporates supply side factors[4] and assess the others as theoretically weak. For completeness, however, all of the other models have been included below.

[4] Ignored because the supply variable is considered insignificant, because of the lack of supply data or for some other theoretical reason (Ball et al, 1998 p 248).

**Hetherington (1988),**

This author employs a regression model to forecast retail rents at the national level. The model uses indirect demand variable such as retail sales and retail profits adjusted for inflation.

**Guissani et al (1993)**

These authors have attempted to relate office rental values of some of the largest cities in Europe to demand side variables.

**Gardiner & Henneberry (1988) Gardiner & Henneberry (1991)**

Gardiner and Henneberry (1988) present a regional office rent prediction model which used GDP (expressed as a percentage of the national GDP) and the quantity of regional office floorspace similarly expressed as a percentage of the corresponding national figure as proxies for the demand and supply side variables. They also present a time series model based on the theory of habit persistence and show how the model could produce forecasts for declining regions (1991).

**VECTOR AUTO REGRESSION**

The final modelling technique which Key et al recognise is that of Vector auto regression. VAR models are non-structural models that are generally used when there is little or no indication of structural relationships. With VAR one only needs to specify the variables that are believed to interact and the largest number of lags needed to capture most of the effects that the variables have on each other. The process is really one of curve fitting for use in short term forecasting (Pindyck & Rubinfield, 1998 p 403). Key et al identify two such studies, both by Kling & McCue (1987 and 1992). These employ VAR modelling to model office and industrial construction.

## REFERENCES

Ball, M. (1998) Institutions in British property research: A review. *Urban Studies*, **35(9)**, 1501-1517.

Barras, R. (1983). A simple model of the office development cycle. *Environment and Planning A*, **15**, pp1361-1394.

Barras, R. and Ferguson, D. (1985). A spectral analysis of building cycles in Britain. *Environment and Planning A*, **17**, 1369-1391

Barras, R. and Ferguson, D. (1987a). Dynamic modelling of the building cycle: 1 Theoretical Framework. *Environment and Planning A*, **19**, 353-367

Barras, R. and Ferguson. D. (1987b). Dynamic modelling of the building cycle: 2 Empirical Results. *Environment and Planning A*, **19**, 493-520

Bischoff, C. (1970). A model of non-residential construction in the United States. *American Economic Review, Papers and Proceedings*, pp10-17.

Evans, M.K. (1969). *Macroeconomic activity: Theory, Forecasting and Control*. Harper and Row, New York.

Gardiner, C. and Henneberry, J. (1988) The development of a simple rent prediction model. *Journal of Valuation*, **7(1)**, pp36-52.

Gardiner, C. and Henneberry, J. (1991). Predicting regional office rents using habit persistence theories. *Journal of Valuation*, **9(3)**, 215-226.

Guissani, B., Hsia, M. and Tsolacos, S. (1993). A comparative analysis of the determinants of office rental values in Europe. *Journal of Property Valuation and Investment*, **11(2)**, 157-173.

Hekmann, J.S. (1985). Rental price adjustment and investment in the property market. *AREUEA Journal*, **13(1)**, 32-47.

Hendershott, P.H., Lizieri, C.H. and Matysiak, G.A. (1997). The workings of the London office market. Reviewed in Ball,M., Lizieri,C and MacGregor, B.D. (1998). *The economics of commercial property markets*. Routledge, London and New York.

Hetherington, J.(1988). Forecasting of rents in *Property Investment Theory*. Eds. MacLeary, A.R. and Nanthakumaran, N. E&FN Spon, London, 97-107.

Jorgenson, D.W. (1971). Econometric studies of investment behaviour: A survey. *Journal of Economic Literature*, 1111-1147.

Key, T., McGregor, B., Nanthakumaran, N. and Zarkesh, F. (1994). *Understanding the property cycle: main report*, RICS, London.

Kling, J.L. and McCue, T.E. (1992). Stylized facts about industrial property construction. *Journal of Real Estate Research, Fall*, 293-304.

Kling, J.L. and McCue, T.E. (1987). Office building investment and the macro-economy – Empirical evidence 1973 to 1985. *AREUEA Journal,* **15(3)**, 234-255.

Nicholson, R. and Tebutt, S. (1979). Modelling new orders for private industrial buildings. *The Journal of Industrial Economics*, 28(2), 147-160.

Pindyck, R.S. and Rubinfield, D.L. (1998). *Econometric models and economic forecasts*. Irwin/McGraw-Hill. Boston, Mass.

Rosen, K.(1984). Towards a model of the office building sector. *AREUEA Journal*, **Fall**, 261-269

Wheaton, W.C., Torto, R.G. and Evans, M.K. (1997). Reviewed in Ball,M., Lizieri,C and MacGregor, B.D. (1998). *The economics of commercial property markets*. Routledge, London and New York.

Wheaton, W.C. and Torto, R.G. (1990). An investment model of the demand and supply for industrial real estate. *AREUEA Journal*, **18(4)**, 530-547.

Wheaton, W.C. (1987). The cyclical behaviour of the National office market. *AREUEA Journal*, **15(4),** 281-299.

**APPENDIX 2**

# Marxist Economic Approaches to Development.

The two main examples of the Marxist approaches revolve around the concept of circuits of capital (Gore & Nicholson , 1991). Boddy (1981) distinguishes three circuits of capital within a capitalist economy (see also Healey, 1991, p232):

- **Industrial capital,** where surplus is generated by the production of commodities.
- **Commercial capital,** where surplus is generated by the purchase and sale of commodities.
- **Interest bearing capital,** where surplus is generated by the purchase and sale of money capital.

Boddy (noted in Healy, 1991, p232) argues that the event sequence of property development process involves all these forms of capital and is structured by the dynamics and the tensions between them. This suggests that the outcome of such dynamics will vary depending upon the relations between the three forms of capital at particular times. Gore & Nicholson (p723) note that the core of the process is a circuit of industrial capital managed by the building contractor who borrows the money capital from a financial institution. On completion the building is purchased by a property company by using interest-bearing capital borrowed from another financial institution. The property company then operates a circuit of capital, selling the space in the building in return for rents, which in turn form the basis of repayments on the borrowed interest-bearing capital. The model highlights the relationship between different aspects of the development process, and the ways in which events that happen in one part of the

circuit can strongly affect the courses in another. However, the scope of the model is too wide for understanding particular development projects other than in a simplistic way (Gore & Nicholson, 1991, p723). It creates a background for development rather than a detailed examination of development per se. The same is true of the second major approach, that due to Harvey (1982 & 1985).

Harvey also defines three circuits of capital (see Figure A2.1). In this case they are:

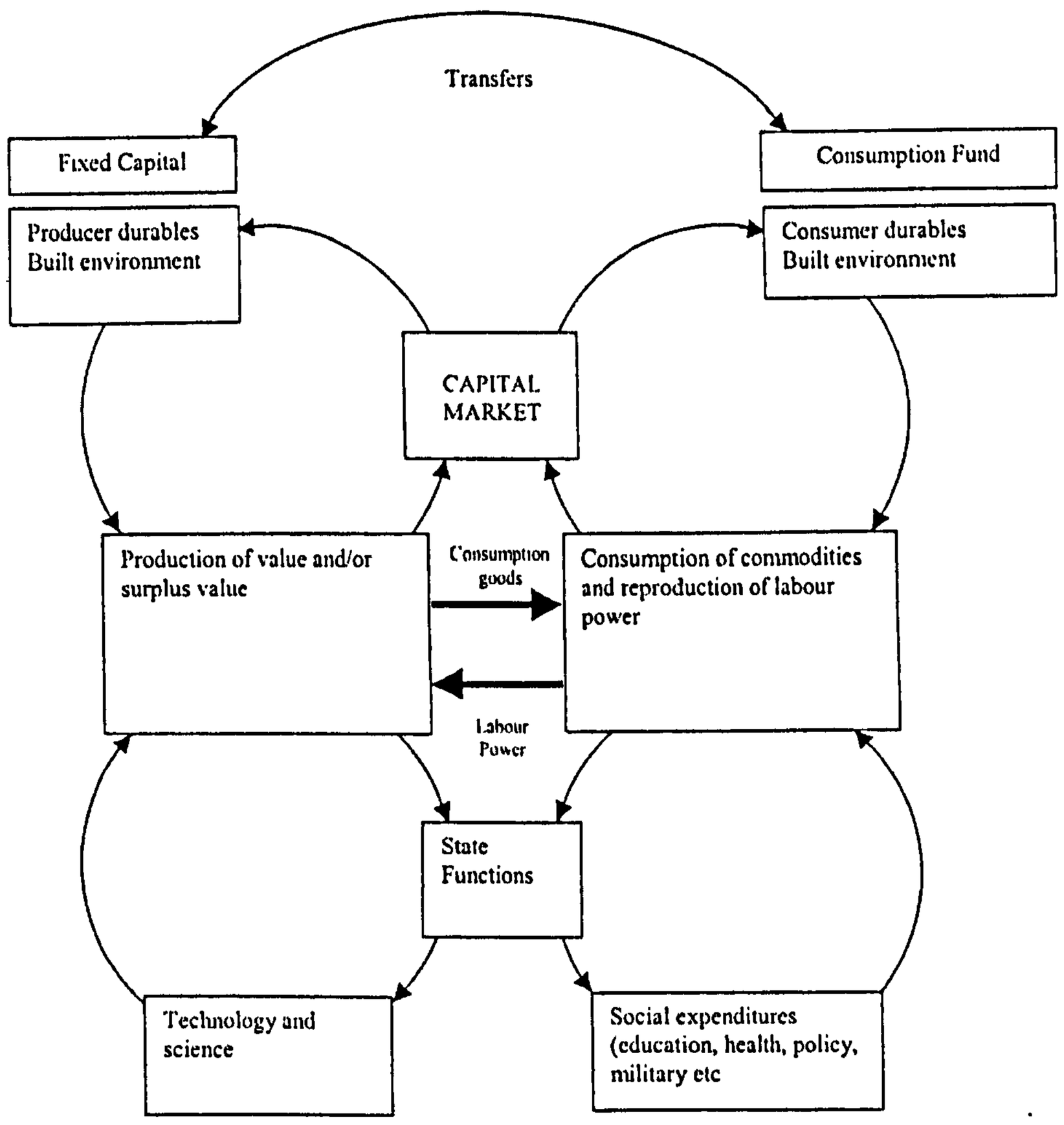


**Figure A2.1The primary, secondary and tertiary circuits of capital (Harvey, 1985).**

- The primary circuit (industrial) in which commodities are produced and consumed and which represents the process that enables capital to expand.

- The secondary circuit through which capital flows via financial and state intermediaries into fixed assets and the formation of consumption assets. Fixed capital includes items used to aid the production process (producer durables such as machinery and means of transport) and items which act as a supporting physical framework within which production takes place such as factories and offices. Consumption capital covers items that act as ads to consumption rather than direct inputs. These include consumer durables such as cookers and washing machines and the physical framework within which consumption takes place e.g. shops, housing etc. It is this circuit in which investment in development activity occurs (Gore & Nicholson, 1991, p723).
- The tertiary circuit which Harvey (1985) identifies in order to locate investment in science and technology (R&D) and social expenditures (welfare services and policing duties). There is little incentive for individual investors to direct capital into these areas which generally remain the responsibility of state agency who channel capital funds into this tertiary circuit.

The analysis stresses the complexity of the links between production (land and property for use), finance capital (land and property for investment) and the state (public policy) in driving investment, dis-investment, development and the abandonment of the built fabric (see Healey, 1991, p234). The analysis suggests that the dynamics of the development process in an urban region derive from general tendencies in financial investment, the role of an urban region within international patterns of economic competition, the effects of this on the economic and spatial structure within a region and the role of public policy in creating and impeding investment opportunities (Healey, 1991). Of these the conversion of landed property under capitalist relations into a

- The north (Standard Life) site.
- The 'south site' to Morrison Road.
- The Western Approach Road

In order to accommodate the Master Plan, the West Approach Road was moved over the Edinburgh/Glasgow railway line (see Figure 7.9).

The Conference Centre, which is at the heart of the Exchange, was completed in 1995. It was the first of the buildings formally part of the original Master Plan to be completed (although Saltire Court and the Baillie-Gifford buildings were completed in 1991). The Conference Centre was funded from capital receipts raised on the basis of the potential value of the Exchange leases in EICC's hands (see Appendix 14). The City raised £25M against the value of potential leases on their Exchange land (Donaldson, 1998). This was put into trust and the interest generated represented the City's initial contribution to EICC Ltd. The Lothian Regional Council contributed a further £1M and the former site of the re-aligned West Approach Road, which was included in the development proposals (the Regional Council ceded this to the City, who leased it to EICC Ltd). LEEL contributed expertise, staffing and £6.75M (for infrastructure, mainly upgrading and realignment of the West Approach Road).

Standard Life approached EICC Ltd. to acquire the north site for a new headquarters building, and more or less bought out the land at day one (following a very brief lease) for £5.9M. They used Edinburgh Development Group as contractor, McAlpine as sub-contractor and Heritable Securities, a subsidiary of Standard Life, as intermediary in the land purchase (Donaldson, 1998). This building was completed in 1996.

financial asset are the most significant. This aspect is considered later in the discussion of systemic change in the development process and the commercial property market.

## REFERENCES

Boddy, M. (1981). *The property sector in late capitalism*: *The case for Britain*. In *Urbanisation and urban planning in capitalist society*, Methuen, London.

Gore, A. and Nicholson, D. (1991). Models of the land development process: A critical review. *Environment and Planning A*, **23(5)**, 705-730.

Harvey, D. (1982). *The limits of capital*. Oxford, Basil Blackwell.

Harvey, D. (1985). *The urbanisation of capital*. Oxford, Basil Blackwell

Healey, P. (1991). Models of the development process: A review. *Journal of Property Research*, **8** 219-238

APPENDIX 3.

# Neo-institutional and institutional cities

## THE NEO-INSTITUTIONAL CITY

The development of the urban economy is governed by bounded rational economic behaviour. Exchange, co-operation and co-ordination happen through exchange of information and through transactions related to individuals and networks. Networks are formed within and among cities.

Bounded rational economic behaviour is also at the basis of the urban polity. Innovative institutions promoting economic decency and based on individual and collective contracting among equal subjects form the core of the new urban political co-ordination system.

The neo-institutional city is a city without production processes. Its citizens are cybernetic, transactional agents and public/private institutions checking uncertainty. Land and real estate are only traded and secured, not used, transformed or abandoned. Medium or long run equilibria in real estate markets are taken for granted. Social relationships are restricted to corporate hierarchies, market exchange, contractual forms of co-operation and respect for laws and rules decided by authoritative institutions, created on a contractual basis. In terms of spatial organisation the neo-institutional city is a network of economic agents occupying sites, trading, negotiating, contracting with each other, leaving no urban land unused. The differentiation in the city is explained by the objective difference between transacted use value and by historic differences in institutions.

## THE INSTITUTIONAL CITY

In the institutional city, the socio-economic system is considered as a whole; this means that levels of reality (physical, biological, social) and structural as well as institutional dynamics interact with each other. Human agency plays an active part in institutional dynamics, but is also determined by it. Different 'worlds' interact with each other. For economic organisation, this means that institutional dynamics interact with 'worlds of production' and that innovative behaviour relates to institutional creativity.

Political regulation can no longer be regarded as instrumentalist, but as reciprocal interaction between domains of regulation and regulatory institutions, rules and practices.

Spatially speaking there is far more variety dis-equilibrium in trade, transaction and communication flows and networks than the neo-institutional predicate suggests. The continuing stressful relationship between 'worlds of production' and institutional dynamics, as well as the strong interaction between economic life, and political and socio-cultural life, leads to a strong variety in urban forms, use and non-use of land and estates. Dis-equilibrium in the real estate markets is the rule.

Different emphases can be found in different currents in the institutional tradition.

## BIBLIOGRAPHY

Lambooy, J G. and Moulaert, F. (1996) The economic organisation of cities: An institutional perspective. *International Journal of Urban and Regional Research*. **20(2),** 217-237.

**APPENDIX 4**

# Systems dynamics and systems feedback

The concept of systems feedback is illustrated in Figure A4.1 (after Coyle, 1996). This is a central element of both engineering control theory and system dynamics.

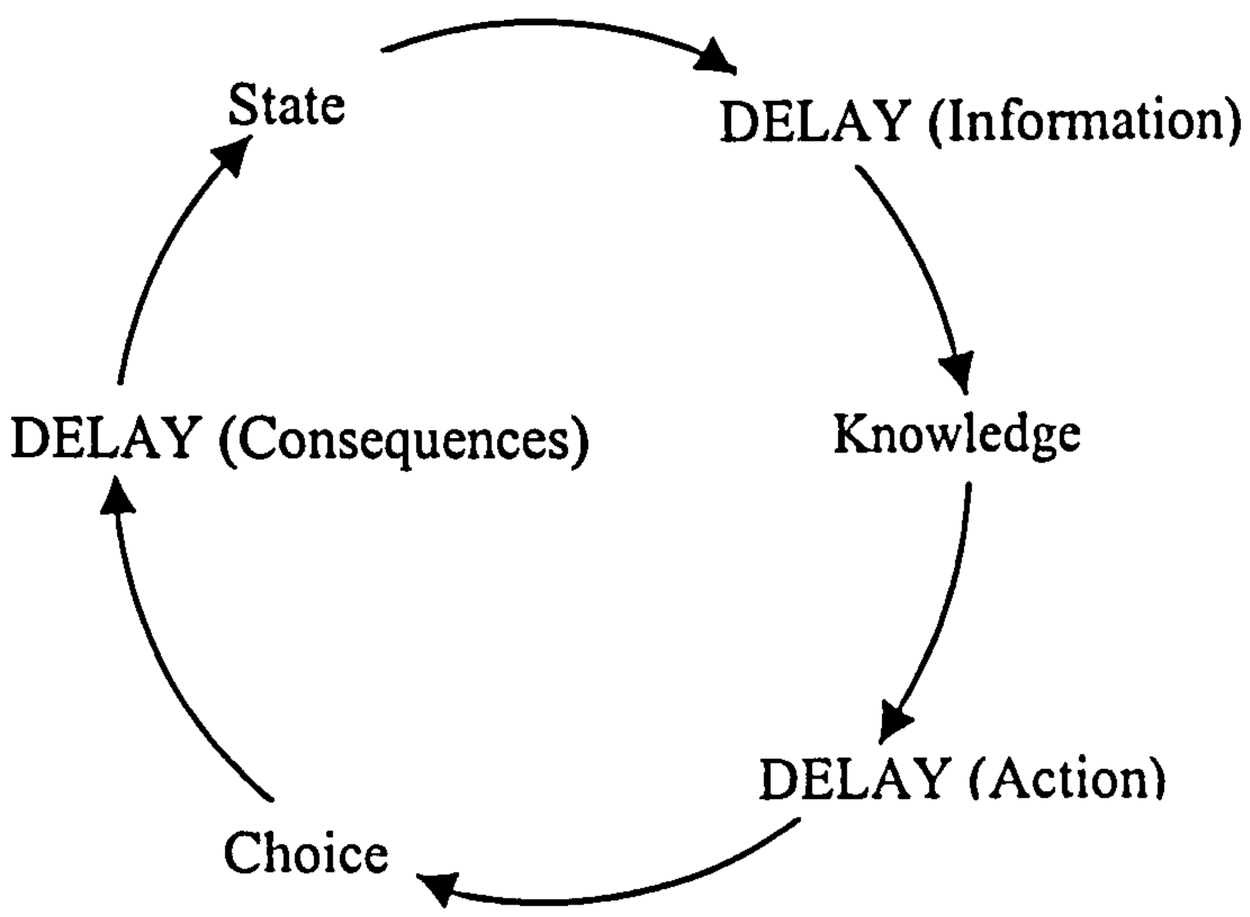


**Figure. A4.1 The logic cycle of systems feedback**

Information produces actions that have consequences generating further action etc. The delays in the loop at the information/action/consequences stages reflect the inherent delays experienced between the choices being made and the effect being felt.

There are two types of feedback loops: goal seeking or negative loops and growth producing or positive loops. In the former (Figure A4.2), when there is a difference between the desired and actual states of the system, actions are generated under the systems

policies to eliminate the difference (the loop seeks the goal of no difference between desired and actual).

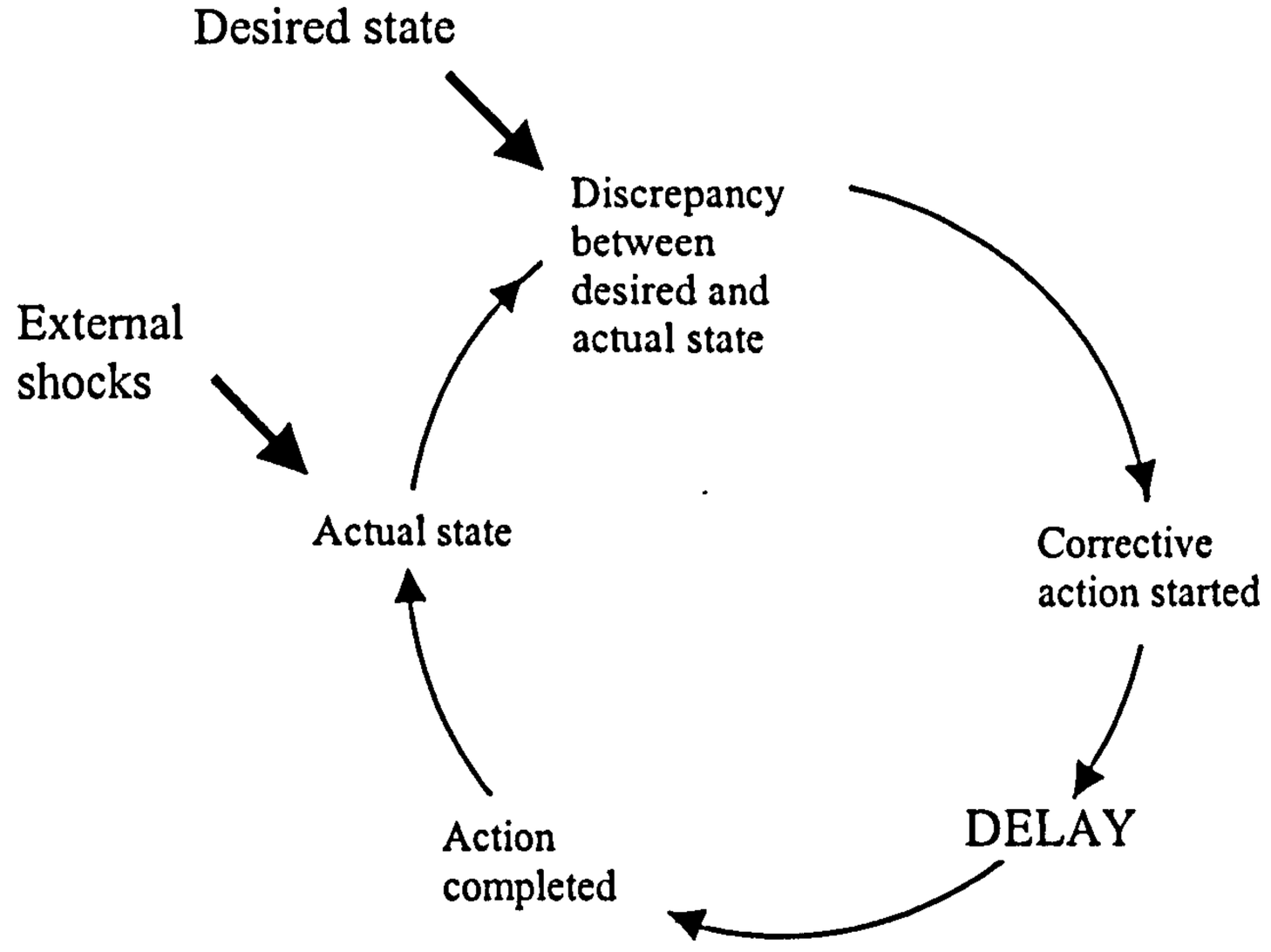


**Figure A4.2 Negative feedback or 'balancing' loop.**

In the case of positive feedback (Figure A4.3) the process is one of growth generating. The processes occurring are reinforcing and are so called 'virtuous cycles' e.g. in Figure A4.4 satisfied customers through word of mouth encourage sales which produces more satisfied customers and so on.

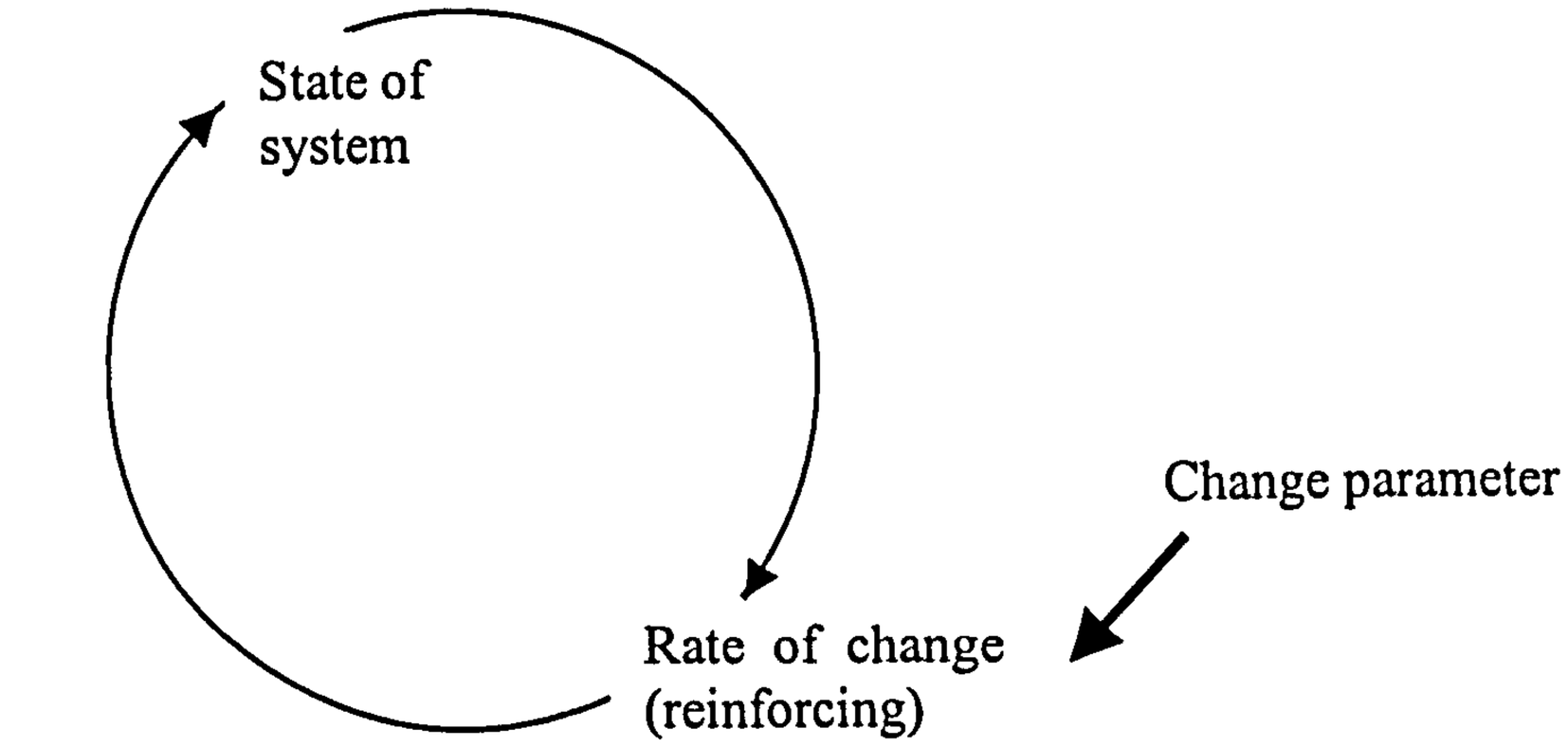


**Figure A4.3 Positive feedback loop**

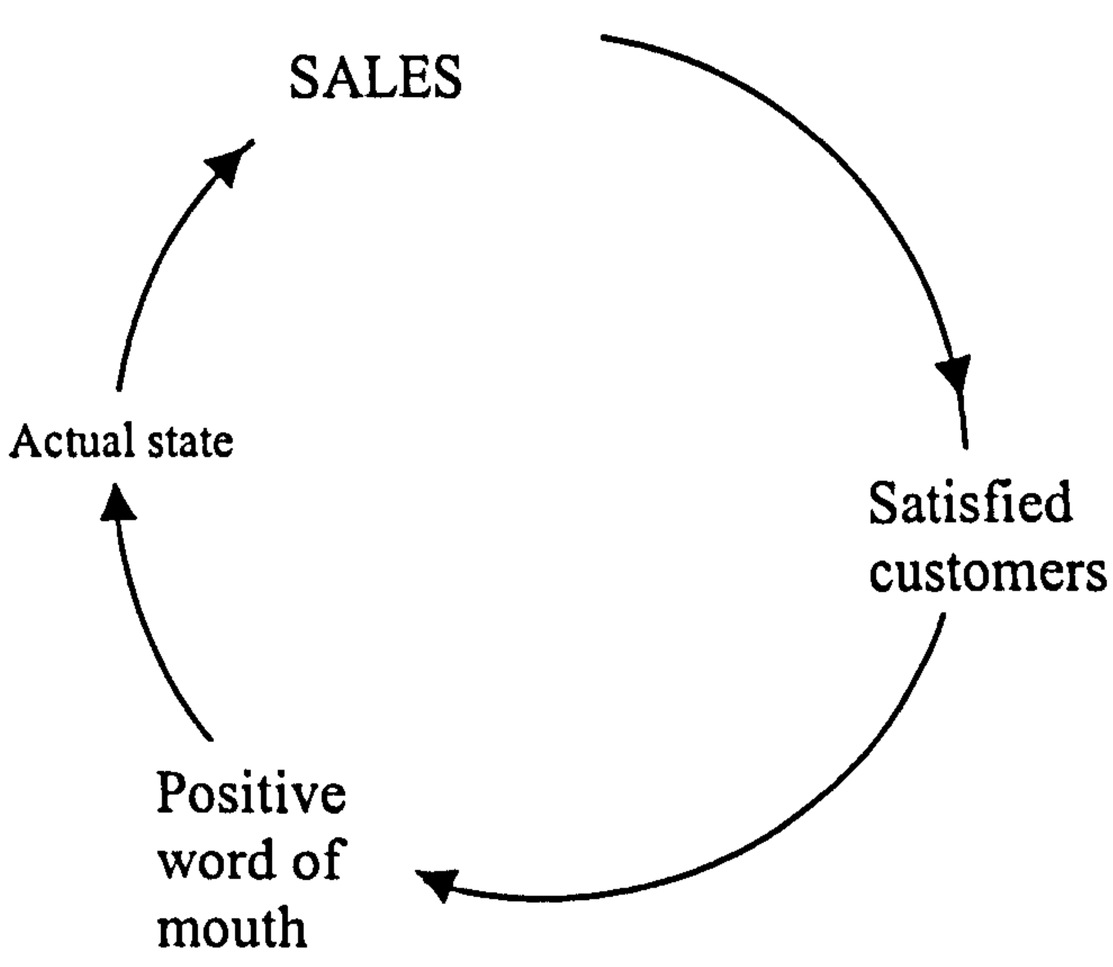


**Figure A4.4 Virtuous circle**

These diagrams are termed influence diagrams and are an important component of the representation and understanding of any system under study

## REFERENCES

Coyle, R.G. (1996). *System dynamics modelling: A practical approach*. Chapman and Hall, London.

**APPENDIX 5.**

# Simulation building blocks

## BASIC BUILDING BLOCKS

### The *ithink* Software

The *ithink* software 'maps' the structure diagram on screen in the form of stocks, flows, converters and connectors. These are the essential building blocks of the diagram and are discussed in detail below. The diagram may be split into sectors eg in the case of the property market, user, investment and development sectors and examination of these in isolation from the overall model is possible. The package also supports multi-variable sensitivity analysis.

### Stocks and Flows

Stocks, symbolised by a rectangle in the package, represent accumulations. In manufacturing these might be accumulation of raw materials, finished goods etc. Finance stocks include cash, debt, payables etc. For the property market model they are used for the accumulation of building stock and rent. Thus at any point in time the state of the system may be represented by the amount of building stock available for letting or sale, the amount of building stock in the process of development or the accumulated rent in the form of rental value.

Flows are symbolised by pipes between stocks (Figure A5.1). They incorporate a pipe with a spigot, flow regulator and arrowhead. Materials flow through the pipe in the direction of

the arrowhead[1]. Flow volume is calculated by the algebraic expression entered into the flow regulator. Conceptually, flows may be deliveries, production etc in manufacturing or revenues, expenses, payments etc in finance. In the property market model they have been used to represent rental change, take up rates, new starts and completions of new buildings. All represent flow of material into or out of stocks of rents, building stock and new development respectively.

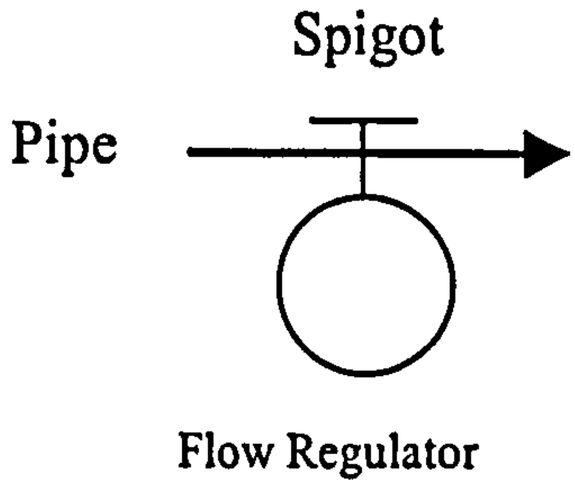


**Figure A5.1. Flows**

Stocks and flows inevitably go together. If there is an accumulation of something, that accumulation has to arise from some activity (a flow of something). In addition, if there is a flow of something there must be an associated build up or depletion. In the simple supply/demand model described below, the supply/demand cycle uses take up rate as a flow out of the available stock on the market for sale or rent (Figure A5.2), whilst completions represent a flow of new building into the overall stock of buildings.

[1] Bi-flow or flow in either direction is also possible.

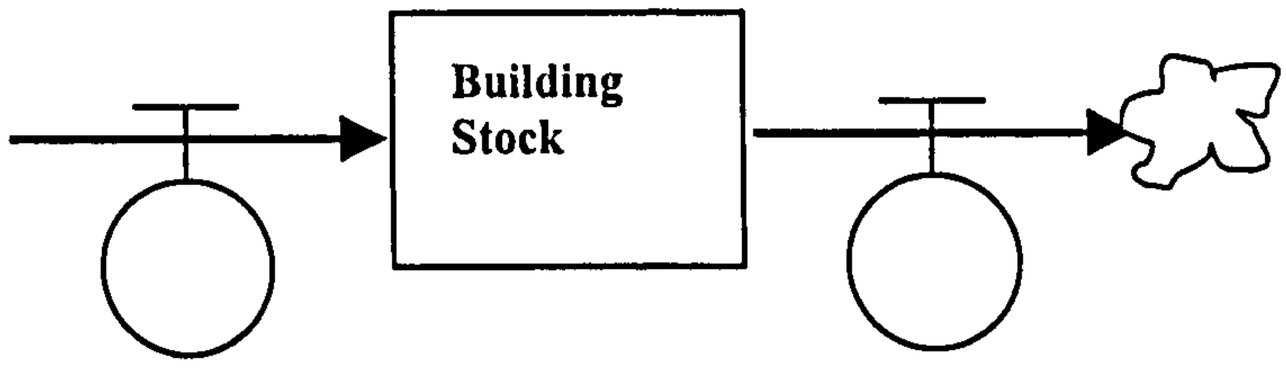


**Figure A5.2. Stocks and Flows**

The "cloud" on the arrow indicates that a boundary of the model has been hit. They represent infinite sources or sinks for flows. A sink cloud indicates that for the purpose of the model an infinite capacity for absorbing exists. A source cloud indicates that, for the purposes of the model, an infinite supply exists.

In the illustrations used so far flows have moved 'material' in one direction only. In some cases, however, it may be necessary to use the same flow to transport 'material' both into and out of an accumulation. For these the bi-flow or bi-directional flow is appropriate. An example of bi-flow also exists from the supply/demand model used later. Thus in Figure A5.3 rental change can cause rental value to go up *or* down.

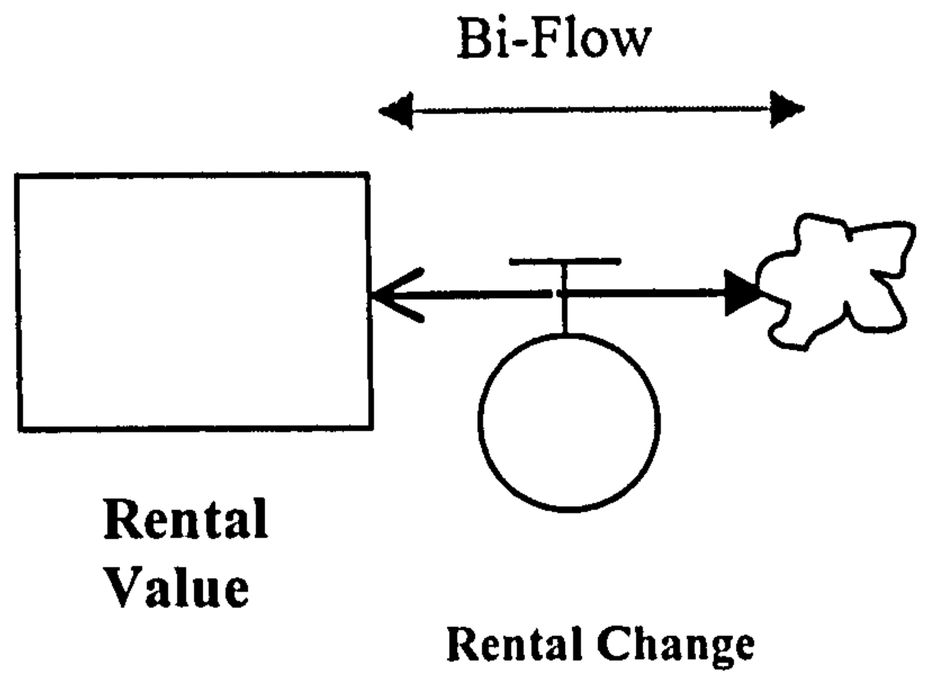


**Figure A5.3. Bi-flow**

Before leaving stocks and flows it is important to note that in modelling:

- Stock values can be allowed to fall below zero but in the case of the stocks for the property supply/demand cycle this has *not* been allowed for obvious reasons.
- Flows are denominated in the same units as the stock with the caveat that they are in units per time.

**Convertors**

Converters are represented by circles. They add detail to the model and basically convert inputs into outputs. Unlike stocks, they do not accumulate. They may be used in a number of ways. In their stock related role they can provide an alternative way of measuring the magnitude of a stock eg in Figure A5.4 of converting inventory into inventory holding cost by inputting average holding cost per unit.

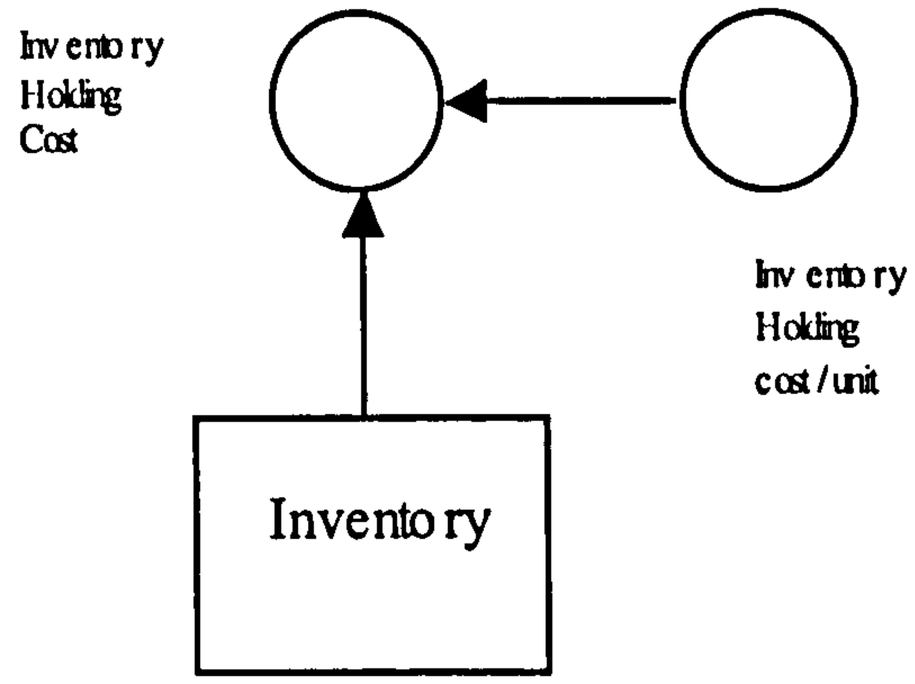


**Figure A5.4 Use of converters (1)**

Graphical functions may be used to help translate the magnitude of a stock into an alternate unit of measure.

In their flow related use, converters can be used to indicate the influences on or the consequences of a flow eg in the case of rent, rental change can be interpreted in terms of rental growth. In addition, the sensitivity of rental change to a variety of factors may be represented as an input to rental change (Figure A5.5).

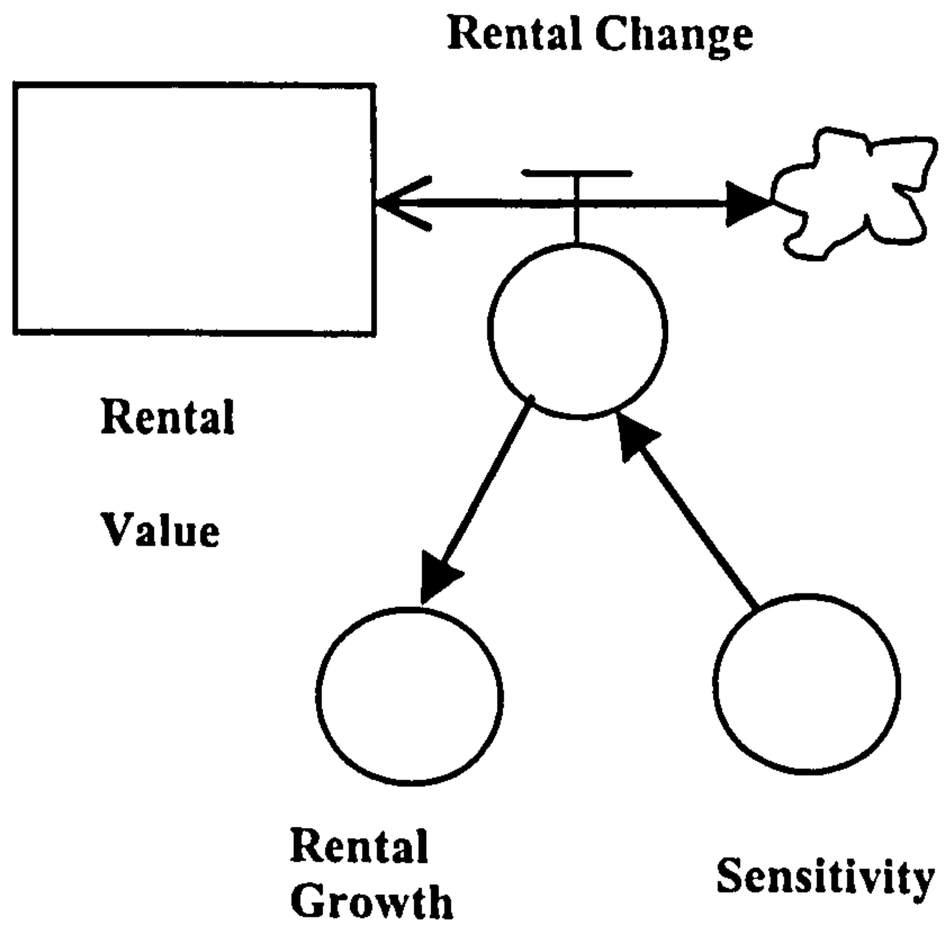


**Figure A5.5 Use of converters (2)**

They may also be used in a flow related way to combine flow processes (Figure A5.6)

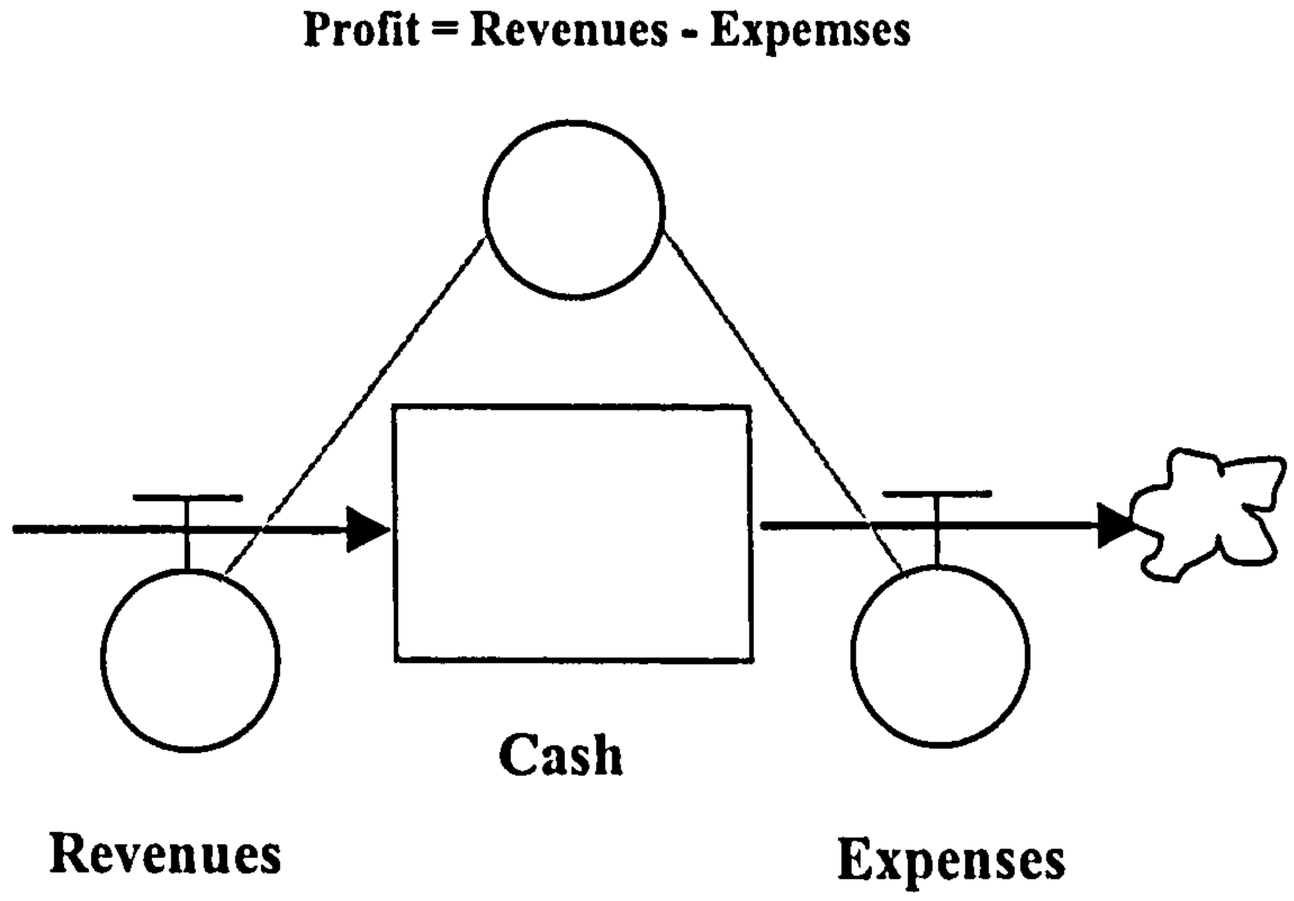


**Figure A5.6 Combining flow processes**

Converters are mostly used, however, as inputs to flows as a means of converting units ie simply as a multiplying factor to get the units right or as data input in the form of an equation or graphical function to relate flows or stocks.

**Use of Stocks as Conveyors**

Conveyors are represented in the model as segmented stocks. Material flows into a conveyor, stays inside for a fixed amount of time and then exits. The different batches of material remain segmented and associated with each batch is a transit time. Thus in the supply/demand cycle of the property model it is used to represent development time for new buildings (Figure A5.7). A number of units of building are started, remain on the conveyor for a defined time (the development period), *in discrete packages*, and exit as completed buildings to move into the overall stock.

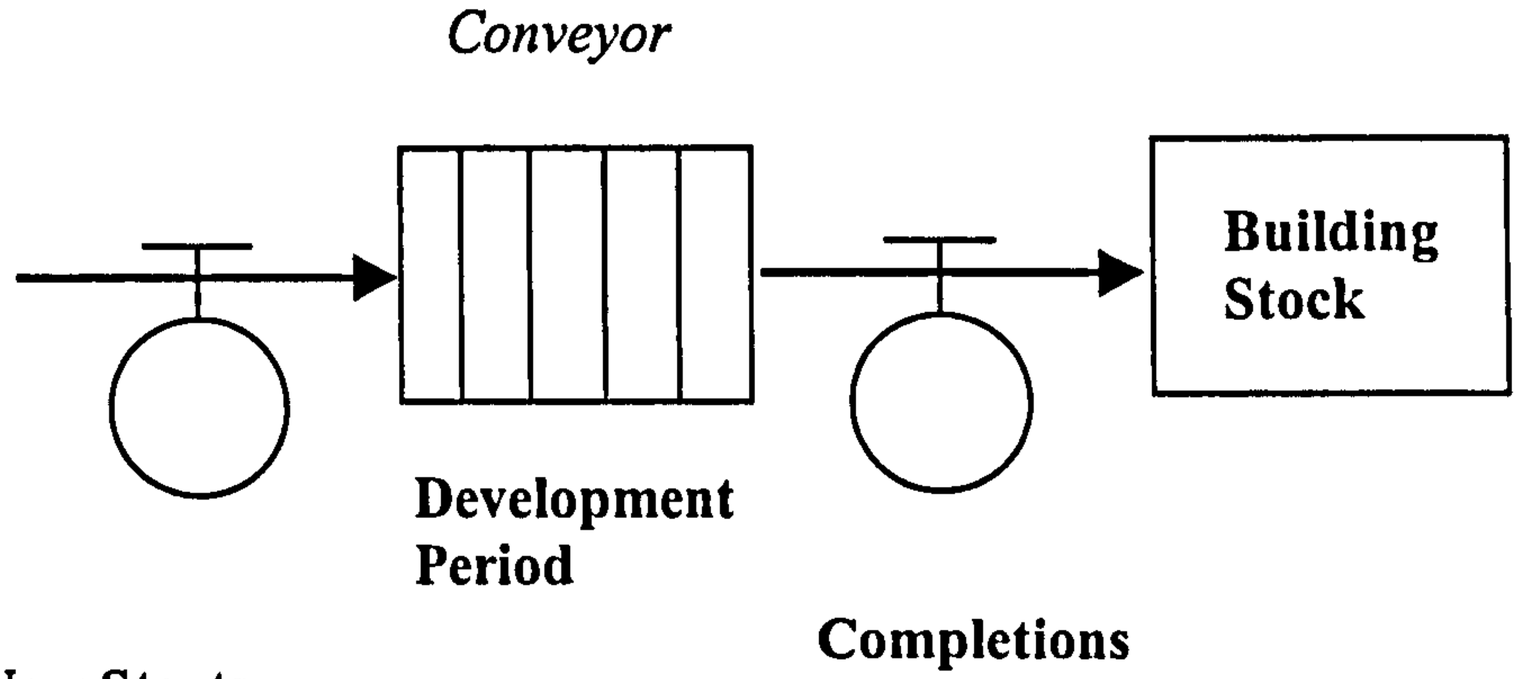


**Figure A5.7 Use of the conveyor**

## Connectors

Connectors link stocks to converters, stocks to flow regulators, flow regulators to flow regulators, converters to flow regulators and converters to other converters. Connectors do not take on numerical values they merely transmit them. In addition, they do not transmit flow. They are really there to hold the whole thing together, show linkages and transmit signals.

## THE SIMULATION ALGORITHMS

It is not the intention to give a detailed view of the mathematical methods used in the simulation software although it is necessary to understand the iterative processes used. The package performs calculations at discrete intervals (dt; these are definable) based on the flow diagram and the equations for each element. The latter are the so called finite difference equations. There is a two stage process involved (High Performance Systems 1997):

- The initiation stage
  - Step 1 creates a list of all the equations in order of evaluation (defined effectively by the flow diagram).
  - Step 2 calculates the initial values for all the stocks and converters in order of evaluation.
- The iteration stage
  - Step 1 estimates the change in stocks over time dt and calculates new values based on this estimate ie:

$$\mathbf{d(stock) = dt * flow}$$

and

$$\mathbf{Stock_t = Stock_{t-dt} + d(stock)}$$

  - Step 2 uses new values of stocks to calculate new values of flows and converters.
  - Step 3 updates the simulation time by an increment of dt. It stops iterating when Time > Simulation end time ie:

$$\mathbf{Time = Time + dt}$$

The reader is referred to High Performance Systems, 1997, for details on how these relate to the differential equations used in the computation of smoothed outputs.

## REFERENCES

High Performance Systems Inc. (1997). *ithink* Reference Manual.

## Appendix 6

## The system interdependencies of market participants

| Market Segment | Space user | Capital | Owner/Manager | Developer | Service provider | Public Interest |
|---|---|---|---|---|---|---|
| **Space user** | Other users affect choices (cost, availability etc) | Cost of capital important input to space user economics. Capital providers fund the creation of space and therefore influence its availability. | Decisions of those who control space are crucial to the utilisation of space by users. | Space demand largely determines the success of a project. | Capital availability is a precondition for a development to proceed. Excessive capital throughout the system not necessarily beneficial for service providers. | Enforcement of public policy objectives influences the quiet enjoyment of environments and their safety. Public space users primary clients are government services. |
| **Capital sources** | Demand by users creates value, provides security, services debt, and generates cash flow. | Decisions by other capital providers influence market conditions and position of the capital provider in a specific investment. | Capital access fundamental to those who own and manage property. | Decisions by developers influence demand for and the value of property interests in which capital invested. | Capital providers use professional services extensively. Quality of service influences the results achieved by capital providers. | Government exerts strong influences over capital markets. |
| **Owner/Manager** | Commitments by users create value and provide financial returns. | Owner/managers initiate & oversee capital committed to real estate involvement. | Decisions by other owner/managers influence a property's competitive position and operating economics. | Developers create properties that compete with and that are sometimes bought by owner/ managers. | Service providers may initiate transaction ideas involving owner/managers and also influence their performance. | Regulation reflecting public interest is major influence on owner/manager involvement in the real estate markets. |
| **Developer** | The ability to attract users determines viability and success of development projects. | Availability of capital essential ingredient in developing property. | Developers influenced by decisions of those who own properties with whom their development projects complete and also may sell their properties to owner/managers. | Decisions by other developers important with regard to competition for resources, determining the viability of a project and in determining the value of the developers overall portfolio. | Developers heavily dependent on service providers. The quality of service provided largely determines the success of projects. | Development activity heavily inter-dependent with public interest regulation. Affects developer's projects and other competing projects. |
| **Service providers** | Users are primary clients of service providers & influence nature & quantity of services demanded. | Capital providers are primary clients of service providers. | Owner/managers are primary users of services for all phases of their real estate involvement. | Developers are the primary clients of service providers. | Real estate service professionals work closely and broadly within their own and between different service segments. | Public interest manifested through Government departments creates demand for professional service providers. |
| **Public Interest** | Users influenced by and influence public interest. | Decisions by capital providers exert major influence on public interest objectives and their achievement. | Issues of disclosure and responsibility important for those who manage property investments for others. | Developers initiative and conduct exert profound influence on public interest priorities. | Promotion of public interest is dependent upon a responsible professional community engaging itself in a manner that promotes certain broader issues. | Government units interact with and influence multiple other Government segments; tax base determines quantity/quality of services to community and property interests. |

# APPENDIX 7

# A simple simulation model of the supply/demand cycle

## THE SUPPLE DEMAND CYCLE

The modelling concepts described in Chapters 3 and 4 have been used to construct a simple supply demand model for illustrative purposes. The aim of this limited modelling is to demonstrate the application of the modelling technique and its ability to reflect the cyclical reference behaviour pattern of rental growth. The basis of the *ithink* model is the supply/demand cycle as outlined in Chapter 4. This has been reconstructed as an *ithink* flow diagram in Figure A7.1 below.

'Active stock', the stock on the market available for sale/let, is represented by a modelling *stock*. This *stock* is filled from the left by completed new construction which has travelled on a *conveyor* representing the development period or lag. The active stock is drained as a result of the take up of stock by the user through the *flow regulator* 'take up rate'.

The transmission mechanism described in Chapter 4 and in the simple model described by Key et al, 1994, relates rental change to stock and rental value as follows:

$$\text{Rental change} = \left[\frac{(\text{Desired stock} - \text{Active stock})}{\text{Active Stock}}\right] * \text{Rental Value} * A$$

where A is a constant reflecting the sensitivity of rental change to vacancy rate (the difference between active stock and desired stock expressed as a fraction of active stock).

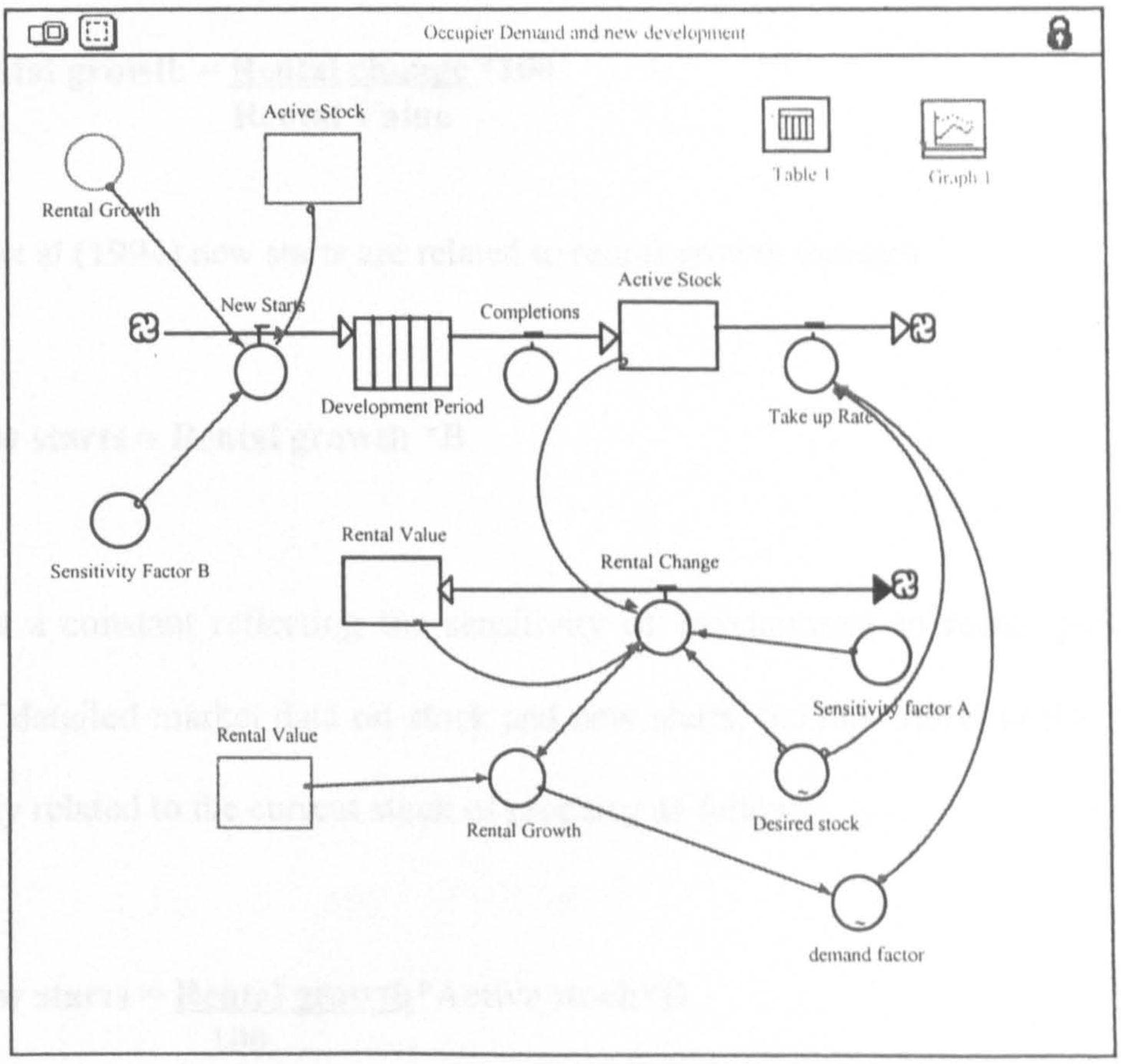


**Figure A7.1. *ithink* representation of the supply demand cycle**

The *ithink* model distinguishes between demand and take up rate. Demand is interpreted as desired stock. This may well be different from the stock actually taken up, depending on the state of the market. It is an issue which is smeared in the mathematical models which represent demand simply as a function of GDP etc. but is one which the modelling technique used here forces the modeller to address. Further work is required to confirm the approach adopted.

The rental change *bi-flow regulator* fills or drains the rental value *stock* and is converted to rental growth by means of a *converter* whereby:

$$\textbf{Rental growth} = \frac{\textbf{Rental change}}{\textbf{Rental Value}} * 100$$

As in Key et al (1994) new starts are related to rental growth through:

$$\textbf{New starts} = \textbf{Rental growth} * B$$

where B is a constant reflecting the sensitivity of development to rental growth. In the absence of detailed market data on stock and new starts, the new starts in the model have been simply related to the current stock of property as follows:

$$\textbf{New starts} = \frac{\textbf{Rental growth}}{100} * \textbf{Active stock} * B$$

The final take up rate is shown to be dependent on a demand factor (related to price elasticity) and the desired stock ie

$$\textbf{Take up rate} = \textbf{Demand factor} * \textbf{Desired stock}$$

The actual take up rate will be a proportion of the desired stock, determined by the current state of the market. The latter has been represented graphically in an arbitrary way in the absence of further information (Figure A7.2 below). It can be varied quite easily in the

model to undertake a 'what if' sensitivity analysis. This figure suggests that in a market where rents are falling the user will be more likely to take up stock, where the active stock permits, and vice versa.

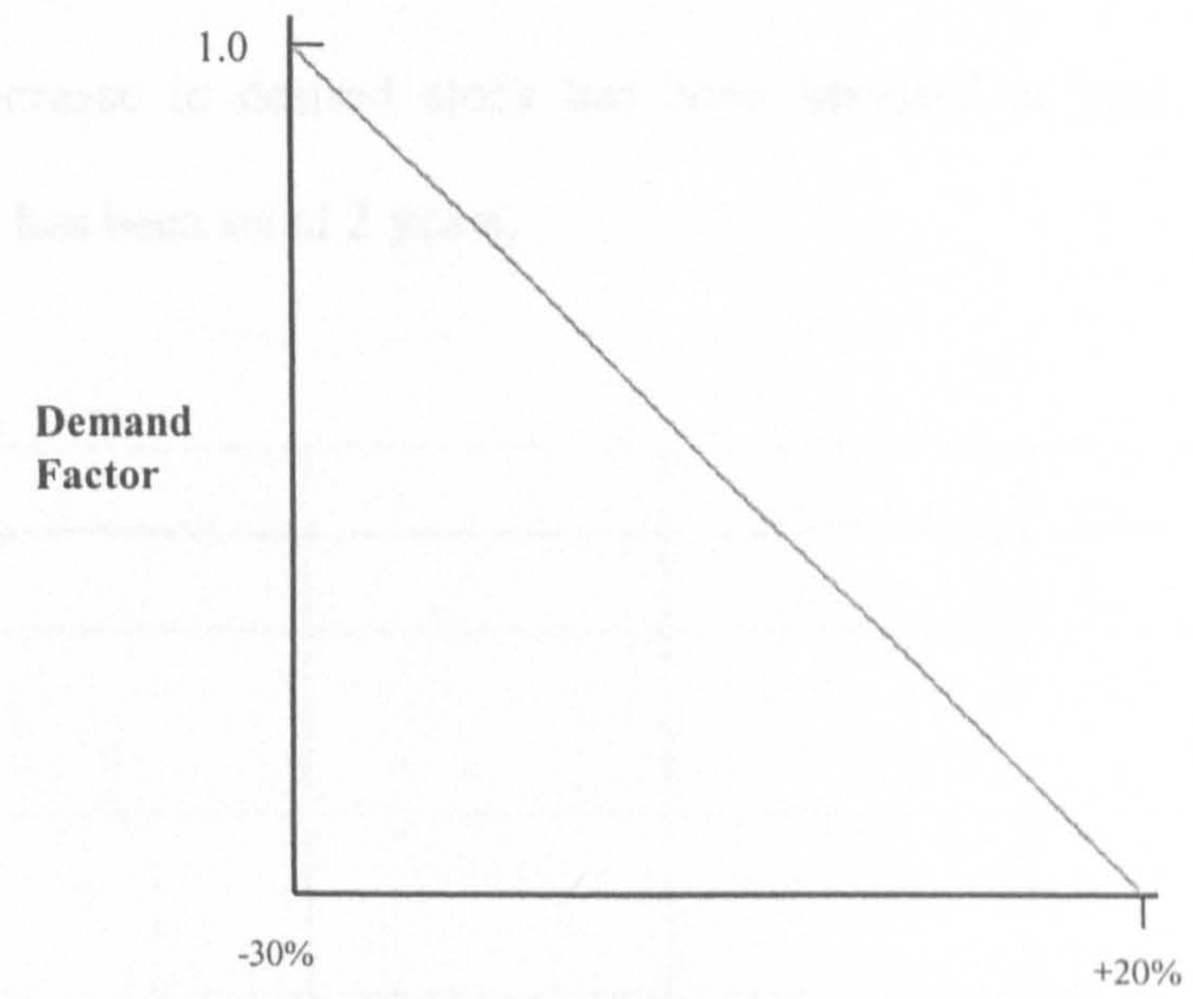


**Figure A7.2. Demand factor assumptions**

In the absence of detailed market information, the model sets the initial stock level and the initial rental value at 100 and measures behaviour against these starting points. It does not affect the relative behaviour of the primary output, rental growth.

**RESULTS**

To test the model an initial situation of stable equilibrium is established where desired stock is growing at a constant rate (approx. 1% pa from an initial starting point of 100) and supply equals demand. The model needs a little time to settle down but from about year 8

there is a long period of zero rental growth (Figure A7.3). These conditions pertain for A equal to 0.5 and B equal to 1.0.

As in the Ket et al minimal model (Key et al, 1994) this model is tested by observing the reaction of rental growth to a demand side shock. This has been tested for three options. In each case an increase in desired stock has been imposed at year 8 of +10% and the development lag has been set at 2 years.

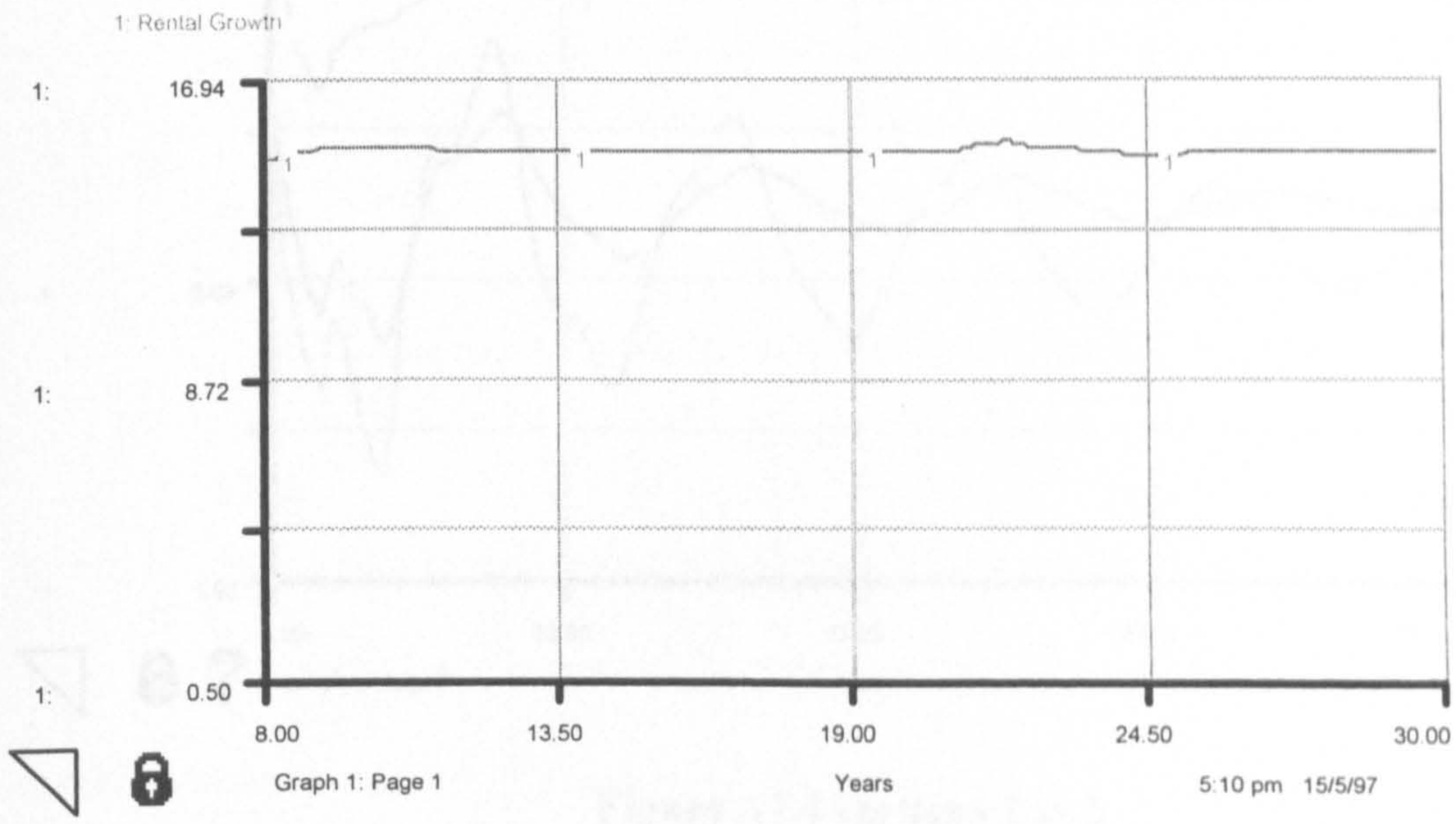


**Figure A7.3. Base line run**

- Option 1 considers a stable market where development is relatively insensitive to rental growth. The constant B has been reduced to 0.5. The demand shock results in some initial fluctuations in rental growth but the latter eventually settles out at an equilibrium level similar to that of the baseline above. (Figure A7.4).
- In option 2, rents and development are more volatile and constants A and B have been adjusted up to 1 and 1.7 respectively. Cyclical behaviour is first observed as a response to the demand shock but this eventually moves to equilibrium at a lower level of rental

growth than in the stable market (Figure A7.4). The implications of this lower level are not understood at this stage.

- In option 3 an unstable market situation is considered. A has now been increased to 1.5 and B to 2. The cyclical behaviour is more pronounced but is moving to equilibrium over a longer time scale than in option 2 above (Figure A7.4).

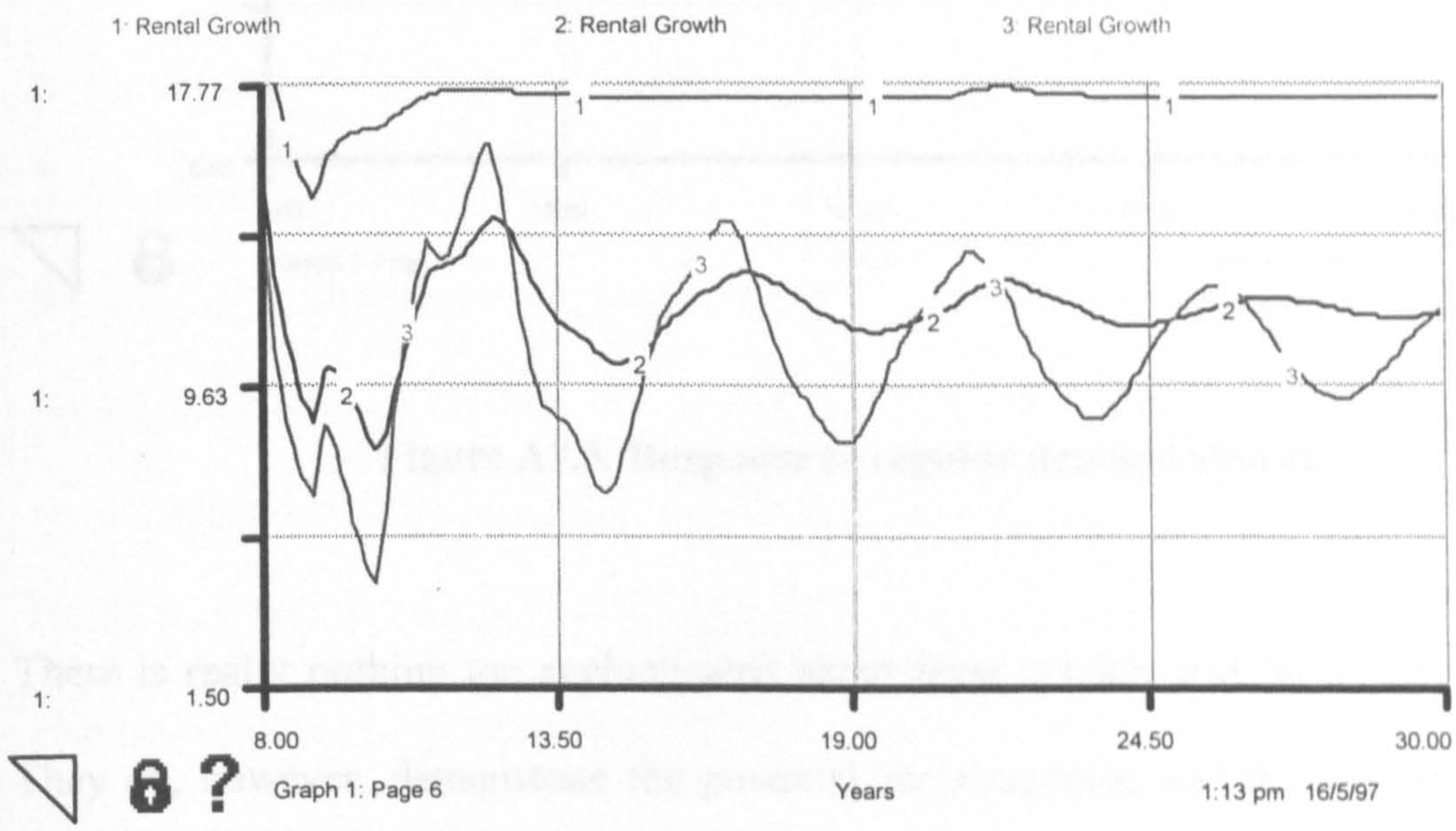


**Figure A7.4 Options 1 to 3**

In addition to the above options, the response of the model to a series of demand shocks of +10% at 4 year intervals has been examined (Figure A7.5). This produces an archtypical cyclical behaviour. There are irregular fluctuations in rental growth around a mean that is again different to that of both the baseline and options 1 to 3 above that (again for unknown reasons but possibly related to the demand factor).

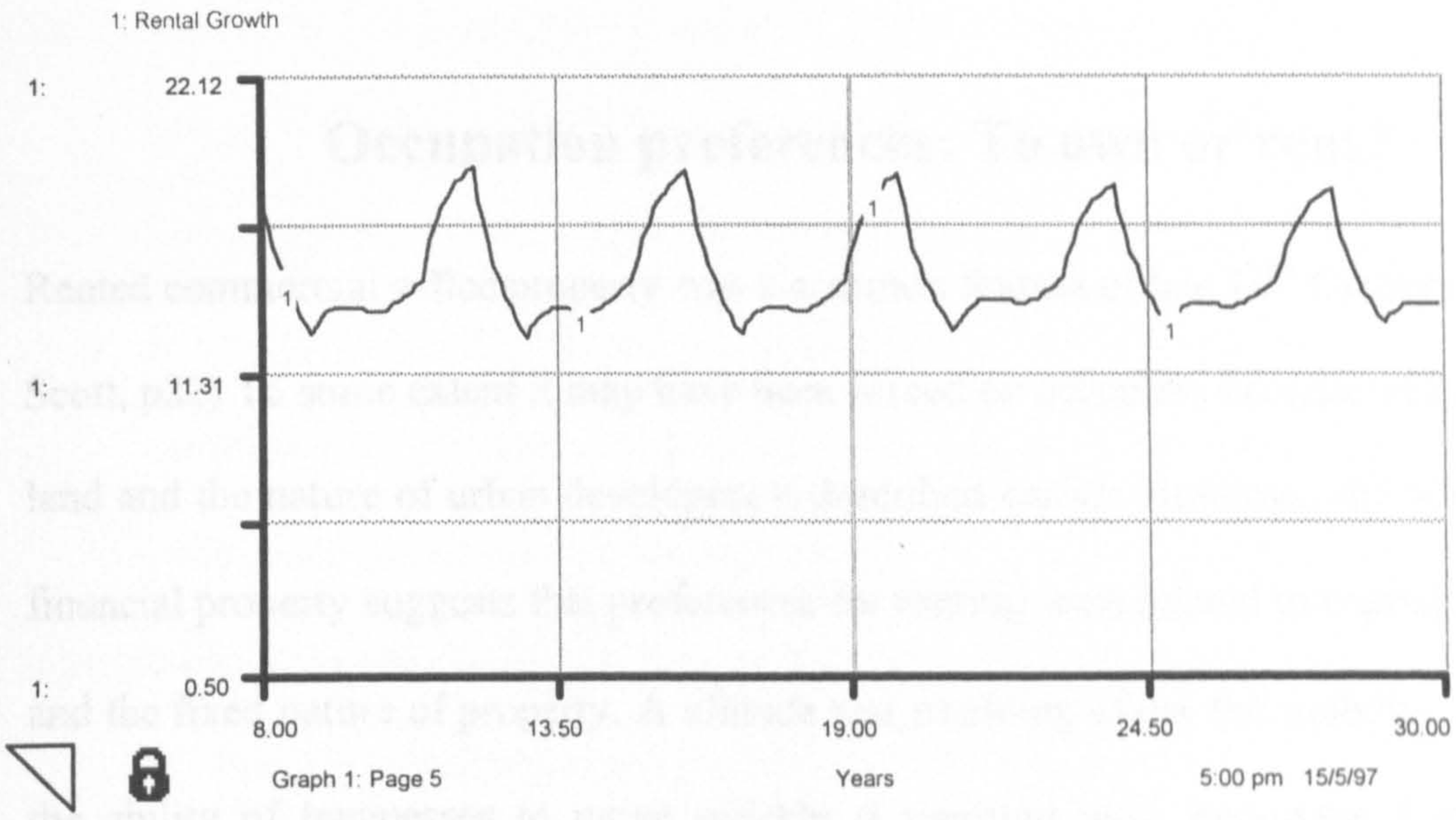


**Figure A7.5. Response to regular demand shocks**

There is really nothing too sophisticated about these models and the results that follow. They do, however, demonstrate the potential for simulation and the ability to play with market situations in a very easy and accessible manner.

**APPENDIX 8**

# Occupation preferences: To own or rent?

Rented commercial office property was a common feature of late 19th Century London (see Scott, p22) To some extent it may have been forced on occupiers because of the shortage of land and the nature of urban development described earlier. However, the whole notion of financial property suggests that preferences for renting were related to capital accumulation and the fixed nature of property. A climate was evolving where the mobility of capital and the ability of businesses to move quickly if required were important. Capital fixed in property could be a liability. Ownership was not necessarily the best form of capitalist tenure. Certainly Scott notes that there was a tendency during the 1920s and 1930s to rent rather than buy during periods of economic uncertainty (the balance between rental and sales preferences tilting in favour of sales upon a return to more stable conditions). The practice of raising capital through sale and lease back, which began to be systematically applied during this period[1], also drove the market in the direction of renting as a preferred way of using commercial property.

No detailed analysis has been undertaken of this process of change. Some indication of the factors that affected it, however, is possible from modern approaches to the issue. Present day factors (Wetherhead, 1997) that influence the decision to rent or buy were probably

[1] Although it had been used for the first time as a technique for raising capital in the 1890s.

also true seventy years ago. Thus the decision to own property has to counter the argument that the capital tied up in property could make better returns elsewhere. In this context:

- Strategic factors such as security, freedom of choice over property management and the ability to choose a unique location and design may be important.
- Economic reasons such as the avoidance of rent rises, avoidance of long term commitments to lease conditions, and potential for long term development opportunities may also be important.

Strategic and economic factors in support of renting, however, include:

- Freedom to move, especially if expansion is predicted.
- Less risk of being tied to an obsolete building.
- Flexibility of size of letting.
- Demands less capital.
- Limits the size of non-liquid capital assets.
- Freedom to choose cheaper or more expensive locations.

Such choices, however, were only possible once a range of suitable properties were available on the market. Freedom to choose only came with an expanding built environment.

## REFERENCES

Scott, P. (1996). *The Property Masters*. Spon. London

Weatherhead, M (1997). Real estate in corporate strategy. MacMillan, London.

# ED

City Development
Property Management - Public Safety
Building Warrants Granted From 1 Jul 2000 to 31 Dec 2000

**Contact** Gordon Moore Building Control Surveyor - 0131 529 4518 - email g.moore@edin-city-dev.demon.co.uk

| Application Number | Estimated Cost of Works | Granted Warrant | Application Type | Old Ludhouse App No | Address | Proposal | Certificate of Completion Issued Date |
|---|---|---|---|---|---|---|---|
| 9605055WAR | 759000 | 09-Oct-00 | WAR | 96/1077 | Imperial Dock Leith Docks Edinburgh | Erect workshop building | |
| 9812964WAR | 3800000 | 11-Sep-00 | WAR | 98/1219 | 28 St. Andrew Square Edinburgh EH2 1YF | Alter & change of use | |
| 9802510STAGEB | 3000000 | 04-Oct-00 | STAGEA | | 12-16 Grassmarket Edinburgh | other stages. | |
| 9903405ACU | 500000 | 08-Sep-00 | ACU | | The Corn Exchange New Mart Road Edinburgh | pends to recreational facility | |
| 9905749ALT | 250000 | 28-Jul-00 | ALT | | 49-51 George Street Edinburgh EH2 2HU | Alteration and Subdivide | |
| 9905927ALT | 250000 | 10-Jul-00 | ALT | | Former Royal High School - Building No. 4 Regent Road Edinburgh EH7 5BL | accommodation | |
| 9906250ALTEX | 375000 | 15-Sep-00 | ALTEX | | Reliable Vehicles Ltd Newbridge Industrial Estate Newbridge Midlothian EH28 8PJ | Alterations and extension to workshop | |
| 9907106DEMER | 225000 | 26-Jul-00 | DEMER | | Dean Park Primary School 31 Marchbank Gardens Balerno Midlothian EH14 7ET | existing | |
| 9907281ACU | 700000 | 25-Aug-00 | ACU | | 12 Ettrick Road Edinburgh EH10 5BJ | housing for the elderly frail | |
| 9907434ALTEX | 10000000 | 05-Oct-00 | ALTEX | | Terminal Building Edinburgh Airport Edinburgh | Stage 3 Phase 2 works | |
| 9802413STAGED | 1650000 | 24-Aug-00 | STAGED | | 24-25 St. Andrew Square Edinburgh EH2 1AF | systems | |
| 9901233STAGEC | 500000 | 11-Oct-00 | STAGEC | | Clocktower Estate South Gyle Crescent Edinburgh | electrical, heating and ventillation | |
| 9907385STAGEB | 3200000 | 10-Jul-00 | STAGEB | | 33-39/45 West Savile Terrace Edinburgh | Proposed residential development | |
| 0000756ALT | 200000 | 07-Aug-00 | ALT | | 191-197 Whitehouse Road Edinburgh EH4 8BU | Alter shop units | |
| 0000757ACU | 1500000 | 19-Oct-00 | ACU | | City Hospital, West Sector Development 51 Greenbank Drive Edinburgh EH10 5SA | Alter & change of use to form seventeen town houses | |
| 0001142ERECT | 4000000 | 22-Aug-00 | ERECT | | Haymarket Goodsyard Haymarket Edinburgh | Erection of office building | |
| 9802413AOW1 | 300000 | 24-Aug-00 | AOW1 | | 24-25 St. Andrew Square Edinburgh EH2 1AF | Erect office developmentfitout for lower ground floor | |
| 0001357ALT | 430000 | 12-Oct-00 | ALT | | 76 Hanover Street Edinburgh EH2 1EL | Alter bank/office accommodation | |
| 0001400ERECT | 4000000 | 01-Aug-00 | ERECT | | Land Off Cliftonhall Road Newbridge Midlothian | external yards and parking areas | |
| 0001795STAGEA | 1300000 | 29-Sep-00 | STAGEA | | Viewforth Bank The Loan South Queensferry West Lothian | Erection of new health centre - Foundations | |
| 0002028ALT | 1111000 | 21-Jul-00 | ALT | | 2-10 North St David Street & 2-3 Queen Street Edinburgh | Alterations to existing offices | |
| 0002094STAGEA | 18651000 | 18-Jul-00 | STAGEA | | Office Building Greenside Place Edinburgh | existing car park building - foundations and substructure | |
| 0002129ALT | 6640000 | 15-Aug-00 | ALT | | Forestry Commission Headquarters 231 Corstorphine Road Edinburgh EH12 7BB | Alter and refurbishment of offices | |
| 0002159ALT | 1000000 | 12-Jul-00 | ALT | | Gemini Building 24-25 St. Andrew Square Edinburgh | Fit out works to existing office building | 07-Feb-01 |
| 0002172EXT | 775000 | 27-Oct-00 | EXT | | Greenbank Parish Church 2A Braidburn Terrace Edinburgh EH10 6ES | Extend church | |
| 0002195ERECT | 330000 | 04-Oct-00 | ERECT | | Forestry Commission Headquarters 231 Corstorphine Road Edinburgh EH12 7BB | Erect temporary accommodation | |
| 0002201ALTEX | 629723 | 25-Jul-00 | ALTEX | | 454 Gorgie Road Edinburgh EH11 2RN | alterations to carpark | |
| 0002206ALT | 830000 | 19-Jul-00 | ALT | | Princes Exchange Earl Grey Street Edinburgh | Fit out of shell offices at building 2 - levels 4 & 5 | 01-Mar-01 |
| 0002409ALT | 300001 | 06-Jul-00 | ALT | | 113 Glasgow Road Edinburgh EH12 8LU | Internal shopfitting | |
| 0002500DEMER | 2660000 | 11-Aug-00 | DEMER | | Napier University Merchiston Campus 10 Colinton Road Edinburgh EH10 5DT | and erection of new computer centre | |
| 0001913ERECT | 5200000 | 02-Oct-00 | ERECT | | Phase 2 Building 4, Broadway Park South Gyle Broadway Edinburgh | Erection of office building and external works | |
| 0002661STAGEA | 2400000 | 11-Aug-00 | STAGEA | | Site Adjacent To "Spitfire House" Turnhouse Road Edinburgh | buildings -foundations substructure underground drainage | |
| 0002695ALT | 300000 | 21-Sep-00 | ALT | | 16 George Street Edinburgh EH2 2PF | Alterations to existing office building | |
| 0002719ALT | 550000 | 07-Sep-00 | ALT | | 30A Chambers Street Edinburgh EH1 1JA | Alterations | |
| 0002859ALT | 330000 | 19-Sep-00 | ALT | | Unit 2 100 George Street Edinburgh | Alter retail outlet | |
| 0002595STAGEA | 7700000 | 06-Jul-00 | STAGEA | | Site A4 Edinburgh Park Edinburgh | park - foundations and substructure | |
| 0002972STAGEA | 3150000 | 22-Aug-00 | STAGEA | | Former Stadium Carpark Logie Green Road Edinburgh | Erect 3 storey office development | |
| 0002981STAGEA | 2300000 | 02-Oct-00 | STAGEA | | Supermarket & Petrol Filling Station At Ferrymuir South Queensferry West Lothian | substructure and underground drainage. | |
| 0003035ACU | 4000000 | 04-Sep-00 | ACU | | Units 1-7 Baileyfield Crescent Edinburgh | Alter & change of use from store to offices | |
| 0003235ALT | 335000 | 14-Jul-00 | ALT | | 57 Henderson Row Edinburgh EH3 5DL | Alter offices | |
| 0003269EXT | 200000 | 26-Oct-00 | EXT | | 47 Buckstone Terrace Edinburgh EH10 6QJ | Extend restaurant and lounge bar | |
| 0003332ALT | 352000 | 06-Oct-00 | ALT | | Edinburgh Airport Edinburgh | Phase 2 of the internal fit out of BM CIP Lounge at Stage 3 | |
| 0003504STAGEA | 8947000 | 12-Oct-00 | STAGEA | | Building A2 Site A Edinburgh Park Edinburgh | Erection of officesFoundations only | |

# Appendix 9.
# Building Control Data

| | | | | | |
|---|---|---|---|---|---|
| 0003576ALT | 1500000 | 11-Sep-00 ALT | Heriot Watt University Research Park Riccarton Campus Currie Midlothian | Alter research building | 12-Oct-00 |
| 0003592ALT | 200000 | 28-Jul-00 ALT | 24 St. John's Road Edinburgh EH12 6NZ | Alter offices - installation of cooling system | |
| 0003749ALT | 200000 | 02-Aug-00 ALT | Unit 21 Kinnaird Park Edinburgh | Fitting out of retail unit and installation of mezzanine | |
| 0003841ALT | 425000 | 13-Sep-00 ALT | 19 North Bridge Edinburgh EH1 1SD | Alter hotel | |
| 0003960ERECT | 4548830 | 29-Sep-00 ERECT | Western General Hospital Crewe Road South Edinburgh EH4 2XU | associated office and ancillary accommodation | |
| 0003975ALT | 500001 | 27-Oct-00 ALT | Shopping Centre Westside Plaza Edinburgh EH14 2FT | Alter shopping centre | |
| 0003998ALT | 500000 | 10-Oct-00 ALT | 100 George Street Edinburgh | Alter shop | |
| 0004049ALT | 300000 | 11-Oct-00 ALT | 35-39 Niddry Street Edinburgh EH1 1LG | Alteration | |
| 0004068STAGEA | 680000 | 29-Sep-00 STAGEA | 6 South Gyle Crescent Edinburgh EH12 9EA | Extend offices foundations substructure and drainage. | |
| 0004100ALTEX | 2400000 | 25-Oct-00 ALTEX | Malmaison Hotel 1-4 Tower Place Edinburgh EH6 7BZ | Alterations and extension to hotel | |
| 9900180AOW2 | 250000 | 05-Oct-00 AOW2 | 84-87 Princes Street Edinburgh | Alterations | |
| 0004229DEM | 800000 | 31-Jul-00 DEM | Edinburgh | Demolish 3 storey housing blocks | |
| 0004278ALT | 1100000 | 17-Aug-00 ALT | 7 Bankhead Medway Edinburgh EH11 4BY | Alterations to existing internet switching site | |
| 0004419ACU | 350000 | 19-Oct-00 ACU | 13 Newtoft Street Edinburgh EH17 8RG | Alter & change of use from shop to offices | |
| 0004452ALTSD | 285000 | 10-Oct-00 ALTSD | "Former Uno" Milton Link Edinburgh | Alter and sub divide into 2 seperate retail units | |
| 0004497STAGEA | 2100000 | 16-Oct-00 STAGEA | Greens Health & Fitness Newmart Road Edinburgh EH14 1RN | Construction of swimming pool with sauna and steam room | |
| 0004517ERECT | 450000 | 13-Nov-00 ERECT | Former Substation Whitehouse Loan Edinburgh | Erection of office building | |
| 0004659DEM | 200000 | 16-Aug-00 DEM | 40,41,43,45,47 Niddrie Marischal Place & 1,3 Niddrie Marischal Gardens | Demolition of 3 storey housing blocks. | |
| 0004978DEM | 300000 | 11-Sep-00 DEM | 1-10 Wauchope Square And 233, 235, 237, 239 Niddrie Mains Road, Edinburgh Edinburgh | Demolition of 3 storey housing blocks | |
| 0005261DEM | 500000 | 06-Oct-00 DEM | Former Whisky Bond Building Anderson Place Edinburgh | building | |
| 0005425ERECT | 880000 | 31-Oct-00 ERECT | 140-144 Duddingston Road West Edinburgh | Erection of industrial units | |
| 0002473EXT | 220000 | 05-Sep-00 EXT | Scotstoun Avenue South Queensferry West Lothian EH30 9DT | Extension to existing cafeteria | 21-Feb-01 |
| 0004535ALT | 250000 | 16-Oct-00 ALT | 100 George Street Edinburgh | Fitting out of shop unit | |
| 0001061ALT | 200000 | 17-Oct-00 ALT | 47 Deanhaugh Street Edinburgh EH4 1LR | Alter public house | |
| 0004183ERECT | 350000 | 17-Oct-00 ERECT | 21 Ellen's Glen Road Edinburgh EH17 7QT | Erect laboratory building | |
| 0001800EXT | 300000 | 19-Oct-00 EXT | George Heriot's Recreation Ground Goldenacre Edinburgh | facilities | 20-Mar-01 |
| 0001833ERECT | 450000 | 15-Aug-00 ERECT | Scotstoun Avenue South Queensferry West Lothian EH30 9DT | Erect temporary building | 13-Mar-01 |

# Appendix 10 Summary of new builds and change of use

| Year Completed | Address | Development Type | Planning Application Number | Floorspace GFA m2 | Floorspace NFA m2 | Total GFA m2 | Total GFA City Involvementm | Local Plan Area | Letting Status | City Involvement | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1987 | 141, George Street | New | | 310 | | | | CEN | Purpose | | Standard Life |
| 1987 | 14a-16, George Street | New | | 1,285 | | | | CEN | Purpose | | Standard Life |
| 1987 | 17-21, Ponton Street | New | | 200 | | | | CEN | | | |
| 1987 | 34, Thistle Street Lane | New | | 250 | | | | CEN | | | |
| 1987 | 35, Chester Street | New | | 288 | | | | CEN | | | |
| 1987 | 14, Melville Street | New | | 378 | | | | CEN | | | |
| 1987 | 125, George Street/ Young Street Lane South | New | | 400 | | | | CEN | | | |
| 1987 | 55, High Street (Sanderman House) | New | | 550 | | | | CEN | | | |
| 1987 | 14, South St Andrews Street | New | | 1,192 | | 4,853 | | CEN | | | |
| 1987 | 246, Leith Walk | New | | 247 | | | | NEE | | | |
| 1987 | Westerhailes Shopping Centre | New | | 325 | | | | O | | Y | |
| 1987 | 263, St John's Road | New | | 350 | | | | O | | | |
| 1987 | 20, Great King Street | New | | 455 | | | | O | | | |
| 1987 | Crewe Road South | New | | 4,320 | | | | O | | | |
| | | | | | | 5,697 | | | | | |
| | | | | | | 10,550 | 325 | | | | |
| 1987 | Jan to June | COU | | 3,648 | | | | CEN | | | |
| 1987 | July to December | COU | | 4,321 | | 7,969 | | CEN | | | |
| 1987 | Jan to June | COU | | 2,139 | | | | O | | | |
| 1987 | July to December | COU | | 5,288 | | | | O | | | |
| | | | | | | 7,427 | | | | | |
| | | | | | | 15,396 | | | | | |
| 1988 | 10, North Bridge Unit | New | | 270 | | | | CEN | Pre-let? | | |
| 1988 | 21-25, George 4 Bridge | New | | 256 | | | | CEN | Purpose? | | Burnett & Robertson |
| 1988 | East Fountainbridge/Eark Grav St/ High Rags | New | | 2,741 | | | | CEN | Spec? | | |
| 1988 | 28 Stafford Street | New | | 350 | | | | CEN | | | |
| 1988 | 24 Broughton Street | New | | 560 | | | | CEN | | | |
| 1988 | 7-8, Randolph Place | New | | 605 | | 4,782 | | CEN | | | |
| 1988 | South Gyle Crescent | New | | 250 | | | | O | Purpose? | Y | Apex Construction for Honeywell |
| 1988 | South Gyle | New | | 1,875 | | | | O | Purpose? | | MIM HQ |
| 1988 | 8, Bankhead Crossway North | New | | 228 | | | | O | Purpose? | | Royal Bank of Scotland |
| 1988 | 25, North junction Street | New | | 440 | | | | O | Purpose? | | |
| 1988 | 496, Ferry Road | New | | 1,800 | | | | O | Purpose? | | S&N |
| 1988 | 184-186, Queensferry Road | New | | 233 | | | | O | | | |
| 1988 | 24, Royal Circus | New | | 340 | | | | O | | | |
| 1988 | 63, Mayfield Road | New | | 370 | | | | O | | | |
| 1988 | 35-37, Eyre Place | New | | 500 | | | | O | | | |
| 1988 | 22, St John's Road | New | | 532 | | | | O | | | |
| 1988 | 2, Wishaw Terrace | New | | 636 | | | | O | | | Castle Rock Housing Association |
| | | | | | | 7,204 | | | | | |
| | | | | | | 11,986 | 250 | | | | |
| 1988 | Jan to June 1988 | COU | | 4,476 | | | | CEN | | | |
| 1988 | July to December | COU | | 9,987 | | 14,463 | | CEN | | | |
| 1988 | Jan to June 1988 | COU | | 7,033 | | | | O | | | |
| 1988 | July to December | COU | | 13,805 | | | | O | | | |
| | | | | | | 20,838 | | | | | |
| | | | | | | 35,301 | NIL | | | | |
| 1989 | 22, Stafford Street | New | 2691/88 | 350 | | | | CEN | | | |
| 1989 | 1, Glenfinlas Street | New | 2277/86 | 2,398 | | | | CEN | | | |
| 1989 | June to December | New | | 2,748 | | | | CEN | | | |
| 1989 | 490, Gorgie Road | New | 1251/89 | 2,096 | | | | CEN | | | |
| 1989 | June to December | New | | 2,096 | | 9,688 | | CEN | | | |
| 1989 | West Inglston | New | 1503/88 | 1,344 | | | | RWE | | | |
| 1989 | Hailesland Place | New | 913/89 | 240 | | | | SEE | | P | |
| 1989 | June to December | New | | 16,801 | | | | SEE | | | |
| 1989 | South Gyle Crescent (Phase 1) | New | 2347/87 | 5,000 | | | | SWE | Spec | Y | South Gyle, Bank of Scotland |
| 1989 | South Gyle Crescent | New | 591/88 | 7,000 | | | | SWE | Spec | | Murray International Holdings |
| 1989 | 6, Redheughs Rigg (South Gyle) | New | 1013/88 | 3,217 | | | | SWE | Purpose? | | South Gyle, Murray International Metals) |
| | | | | | | 33,602 | | | | | |
| | | | | | | 43,290 | 5,000 | | | | |
| 1989 | 45-47, Albany Street | COU | 2669/87 | 306 | | | | CEN | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1989 | 9, Blair Street | COU | 2287/88 | 319 | | CEN | | | | |
| 1989 | 3, Boroughloch Sqare | COU | 2352/88 | 516 | | CEN | | | | |
| 1989 | 11-13A, Castle Street | COU | 2687/87 | 720 | | CEN | | | | |
| 1989 | 38, Dean Park Mews | COU | 833/89 | 280 | | CEN | | | | |
| 1989 | 142, High Street | COU | 1601/88 | 928 | | CEN | | | | |
| 1989 | 9, Union street | COU | 327 | 340 | | CEN | | | | |
| 1989 | 155-159, Warrender Park Road | COU | 1076/89 | 263 | | CEN | | | | |
| 1989 | June to December | COU | | 2,789 | | CEN | | | | |
| 1989 | June to December | COU | | 883 | 7.344 | CEN | | | | |
| 1989 | 45-47, Timberbush | COU | 2109/87 | 538 | | NEE | | | | |
| 1989 | 81, Inglis Green Road | COU | 1871/88 | 427 | | RWE | | | | |
| 1989 | June to December | COU | | 4,325 | | SEE | | | | |
| 1989 | Westerhales Shopping Centre | COU | KD 5/88 | 660 | | SWE | | Y | | |
| 1989 | 160, Glasgow Road | COU | 1987/88 | 2,000 | 8,650 | SWE | | | | |
| 1989 | 32, Hailes Ave | COU | 858/89 | 700 | 15,994 660 | SWE | | | | |
| 1990 | 113/115, Dundas Street | New | 1889/87 | 6,450 | | CEN | Purpose | | From CDD list. BC list only shows for later alterations. | |
| 1990 | 8, Glenogle Road (Standard Life) | New | 2320/87 | 7,757 | | CEN | Purpose | | | |
| 1990 | Tanfield Canonmills | New | 334/86 | 18,460 | | CEN | Purpose | | | |
| 1990 | 32, York Place | New | 1532/89 | 225 | | CEN | Spec | | | |
| 1990 | 170/210, Causewayside | New | 1779/89 | 3,138 | | CEN | Spec | | | |
| 1990 | 12, Blenheim Place (Scottish Equitable) | New | 2147/89 | 4,549 | | CEN | Spec | | | |
| 1990 | Haymarket Terrace (Apex 2000) | New | 2256/87 | 9,392 | | CEN | Spec | | CDD Data used BC data unclear - entry for Unit 1 Haymarket Trrace. | |
| 1990 | 12-14, Hillside Crescent | New | 1103/89 | 1,275 | 51,246 | CEN | Spec | | | |
| 1990 | 186, Commercial Street | New | 1327/90 | 338 | | NEE | Purpose | | | |
| 1990 | 4, Marine Drive | New | 451/90 | 1,680 | | SEE | Purpose | | Note also COU 1995 | |
| 1990 | Traquair Park East | New | 2626/88 | 2,465 | | SEE | Spec | | | |
| 1990 | 6, Radheughs Rigg (Ph 6) | New | 2051/88 | 7,896 | | SWE | Purpose | | Purpose based on Murray Int Holdings applicant & occupant | |
| 1990 | 2, Bankhead Crossway North (Bank of Scotland) | New | 1947/89 | 1,594 | | SWE | Purpose | | Not on BC printout. | |
| 1990 | W1 Bus Park Ph 1, Cultins Road | New | 2527/89 | 4,181 | 18,154 | SWE | Spec | | | |
| | | | | | 69,400 NIL | | | | | |
| 1990 | 1/2, Blenheim Place (Royal Bank of Scotland) | COU | 2182/88 | 362 | | CEN | Purpose | | | |
| 1990 | 23, Annandale Street Lane (Standard Life) | COU | 1033/88 | 425 | | CEN | Purpose | | Based on Std Life applicant & occupant | |
| 1990 | 8, Picardy Place | COU | 1171/89 | 418 | | CEN | Spec | | | |
| 1990 | 181, Pleasance | COU | 163/89 | 750 | | CEN | Spec | | | |
| 1990 | 12, Shandwick Place | COU | 2075/88 | 1,440 | | CEN | Spec | | | |
| 1990 | St Mary's Street Church Hall | COU | 1922/88 | 1,476 | | CEN | Spec | | | |
| 1990 | 95, Broughton Road | COU | 121/89 | 1,560 | | CEN | Spec | | | |
| 1990 | 13, Greenhill Terrace | COU | 254/87 | 700 | | CEN | Spec | | | |
| 1990 | 4A, Merchiston Crescent | COU | 36/89 | 332 | | CEN | Spec | | | |
| 1990 | 10-15, Princes Street | COU | 77/89 | 900 | | CEN | Spec | | | |
| 1990 | 46, Queensferry Street/2-4, Hope Street | COU | 619/87 | 650 | 9,013 | CEN | Spec | | | |
| 1990 | Leith Docks | COU | 438/88 | 600 | | NEE | Purpose | | Based on Forth Ports applicant & occupant | |
| 1990 | 24, West Shore Road | COU | 2037/89 | 331 | | NEE | Purpose | | Based on Offline Systems applicant & occupant | |
| 1990 | 6, Western Corner | COU | 2355/88 | 460 | | NEE | Purpose | | Based on Lord Roberts Workshop applicant & occupant | |
| 1990 | 7,9,10, Commercial Street | COU | 209/89 | 550 | | NEE | Spec | | | |
| 1990 | 62/66, Newhaven Road | COU | 2098/89 | 1,261 | | NEE | Spec | | | |
| 1990 | 25/27, Straton Road | COU | 1658/90 | 264 | | SEE | Purpose | | | |
| 1990 | 146, duddingston Road West | COU | 1926/89 | 614 | | SEE | Purpose | | Based on Atlantic Management applicant & occupant | |
| 1990 | Craiglockhart Drive South | COU | 2383/88 | 1,660 | 5,740 | SWE | Purpose | Y | Lothian Regional Council applicant & occupant | |
| | | | | | 14,753 1,660 | | | | | |
| 1991 | 20, Castle Terrace | New | 69/88 | 16,850 | | CEN | Spec/PL | Y | Saltire Court. BC entries relate to alterations only See working sheet. | |
| 1991 | 1, Queen Street | New | 1503/89 | 513 | | CEN | Spec | | Have used CDD data. No reconciled data from BC. | |
| 1991 | 1-2, St Andrews Square | New | 1424/86 | 2,787 | | CEN | Spec/PL | | Only BC entry is as shown & probably relates to later alterations. | |
| 1991 | Bernard Terrace | New | 218/90 | 4,108 | | CEN | Spec | | | |
| 1991 | 81/85, George Street | New | 2114/88 | 3,408 | | CEN | Pre-let | | New Build on CDD list. | |
| 1991 | 23, Hardwell Close | New | 512/91 | 395 | | CEN | Pre-let | | | |
| 1991 | Henderson Row/E Silvermills Lane | New | 794/88 | 5,853 | | CEN | Purpose | | Scottish Life | |
| 1991 | 89, Haymarket Terrace | New | 784/88 | 5,244 | | CEN | Spec | | | |
| 1991 | 1, Queensferry Terrace | New | 358/89 | 990 | | CEN | Spec | | | |
| 1991 | 6/14, Waterloo Place | New | 2374/88 | 5,839 | | CEN | Spec | | | |
| 1991 | 4, Rutland Court (Baillie Gifford) | New | 296/87 | 4,807 | | CEN | Pre-let? | Y | Development on land part of which was owned by City. | |
| 1991 | Lochend Green Road (Beaverbank Ph 1 & 2) | New | 655/89 | 8,507 | 59,099 | CEN | Pre-let? | | | |
| 1991 | Graham Street | New | 69/90 | 750 | | NEE | Purpose | | | |
| 1991 | 200, Sir Harry Lauder Road | New | 2450/90 | 360 | | SEE | Purpose | | | |

# Appendix 10 Summary of new builds and change of use

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1991 | Newbridge Industrial Estate | New | 740/90 | 330 | | SEE | Purpose | | |
| 1991 | Newbridge Ind Estate | New | 2110/90 | 576 | | SEE | Purpose | | Murray Int Metals |
| 1991 | South Gyle Park (Olivetti/Computerland) | New | 872/88 | 4,645 | | SWE | Pre-let | Y | |
| 1991 | South Gyle Crescent(HMSO) | New | D5/90 | 1,350 | | SWE | Purpose | Y | |
| 1991 | South Gyle Crescent (Bank of Scotland) Ph 2a | New | 2399/90 | 1,000 | | SWE | Purpose | Y | |
| 1991 | South Gyle Crescent (Bank of Scotland) Ph 2 | New | 2687/88 | 6,864 | | SWE | Purpose | Y | |
| 1991 | South Gyle Crescent (Bank of Scotland) Ph 3 | New | 19/90 | 7,566 | | SWE | Purpose | Y | |
| | | | | | 23 441 | | | | |
| | | | | | 82,540 | 26,232 | | | |
| 1991 | 3, St Andrews Square | COU | 2842/90 | 700 | | CEN | Pre-let | | Occupant Scottish Provident |
| 1991 | 44, Dundas Street | COU | 2072/90 | 210 | | CEN | Pre-let | | |
| 1991 | 10A, Gloucester Place | COU | 2499/88 | 550 | | CEN | Pre-let | | |
| 1991 | 30, Grindlay Street | COU | 1784/89 | 1,654 | | CEN | Pre-let | | |
| 1991 | 53, Newington Road | COU | 2364/90 | 260 | | CEN | Pre-let | | |
| 1991 | Hopetoun Street | COU | 695/90 | 393 | | CEN | Purpose | | Applicant & occupant Bellevue Cash & Carry |
| 1991 | 25A,27A,29A, Stafford Street | COU | 2872/89 | 280 | | CEN | Purpose | | Applicant & occupant Stafford Estates |
| 1991 | 142/148, Pleasance | COU | 1008/90 | 1,520 | | CEN | Purpose? | | Applicant & occupant Lothian Health Board |
| 1991 | 35, St Andrews Square | COU | 30/91 | 680 | | CEN | Purpose? | | Applicant & occupant Morgan Grenfell |
| 1991 | 5, Hope Street Lane | COU | 2378/88 | 200 | | CEN | Purpose? | | Applicant & occupant American Express |
| 1991 | 40/50, Blackfriars | COU | 1962/89 | 2,000 | | CEN | Spec | | |
| 1991 | 7-8, Hopetoun Cres | COU | 7908/89 | 1,311 | | CEN | Spec | | |
| 1991 | 8/10, St Andrews Street South | COU | 17/90 | 1,500 | | CEN | Spec | | |
| 1991 | 18, Greenside Lane | COU | 715/90 | 365 | | CEN | Spec | | |
| 1991 | 12A, Rutland Square | COU | 1180/90 | 288 | | CEN | Spec | | |
| 1991 | 21, Stafford Street | COU | 1369/90 | 201 | | CEN | Spec | | |
| 1991 | 1/3, York Place | COU | 2564/89 | 384 | 12,496 | CEN | Spec | | |
| 1991 | 27-32 (29/30), Maritime Street | COU | 964/89 | 420 | | NEE | Pre-let | | |
| 1991 | 53/57, Timberbush | COU | 2918/89 | 332 | | NEE | Pre-let | | |
| 1991 | 14-15, Links Place (Links Place Phase27) | COU | 1981/83 | 4 645 | | NEE | Spec | | Refurbished 1991 Vacated 1997 & further refurbished |
| 1991 | 58/59, Timberbush | COU | 222/90 | 464 | | NEE | Spec | | |
| 1991 | 35, Timberbush | COU | 149/89 | 1,120 | | NEE | Spec/PL | | |
| 1991 | 15, Elbe Street | COU | 97/89 | 460 | | NEE | | | |
| 1991 | 53/57, Timberbush | COU | 0001/91 | 500 | | NEE | | | |
| 1991 | Cramond House | COU | 306/90 | 631 | | RWE | Pre-let | | |
| 1991 | Roddinglaw House, Gogar | COU | 2447/90 | 338 | | RWE | Pre-let | | Applicant & occupant Game & Playtime |
| 1991 | The Loan, South Queensferry | COU | 768/90 | 584 | | RWE | Purpose? | | Applicant & occupant Blair Anderson |
| 1991 | Hillwood, Clermiston | COU | 2100/88 | 1,100 | | SEE | Spec | | |
| 1991 | Mortonhall Park, Mortonhall | COU | 1129/89 | 706 | | SEE | Spec | | |
| | | | | | 11,300 | | | | |
| | | | | | 23,796 | NIL | | | |
| 1992 | Loose Green Road (Beaverbank Ph 3) | New | 1882/91 | 2,166 | | CEN | Pre-let | | |
| 1992 | 193, Dairy Road | New | 3004/90 | 500 | | CEN | Purpose | | Applicant & occupant Cairnmore Housing Association |
| 1992 | 38, Scannes | New | 1058/90 | 313 | | CEN | Purpose | | |
| 1992 | 50, East Fettes Ave | New | 2316/90 | 1,300 | | CEN | Purpose | | Christian Salvessen |
| 1992 | Belford Road, High Green | New | 2567/87 | 250 | | CEN | Spec | | |
| 1992 | 34, Calton Road | New | 2555/89 | 425 | | CEN | Spec | | |
| 1992 | 11/23, Launston Street | New | 821/90 | 2,200 | 7,154 | CEN | Spec | | |
| 1992 | 6, Mill Lane | New | 223/91 | 980 | | NEE | Spec | | Alter & extend offices |
| 1992 | Quality Street | New | 1929/90 | 1,700 | | NEE | Spec | | |
| 1992 | 500, Gorgie Road | New | 2645/91 | 1,700 | | SEE | Pre-let | Y | Building control entry is extend offices. |
| 1992 | 498, Gorgie Road | New | 2344/91 | 3,900 | | SEE | Pre-let | Y | Occupant Lothian Regional Council |
| 1992 | Clifton hall Road, Newbridge Ind Estate | New | 84/90 | 440 | | SEE | Purpose | | Applicant & occupant Sports Turf Services |
| 1992 | Newbridge Industrial Estate | New | 214/91 | 648 | | SEE | Purpose | | Applicant & occupant Scotcem |
| 1992 | Riccarton Research Park | New | 2657/89 | 1,422 | | SEE | Purpose | | Applicant & occupant Syntex Pharmaceutical |
| 1992 | 570 (now 600), Gorgie Road | New | 2284/90 | 4,273 | | SEE | Spec/PL | | Only BC entries seen relate to later work |
| 1992 | South Gyle Crescent | New | 1456/90 | 27,000 | | SWE | Purpose | Y | |
| 1992 | 7, South Gyle Broadway | New | 2541/91 | 2,500 | | SWE | Purpose | Y | S&N |
| | | | | | 44,563 | | | | |
| | | | | | 51,717 | 35,100 | | | |
| 1992 | 33, Alva Street | COU | 2366/91 | 270 | | CEN | Pre-let | | |
| 1992 | 7/9 Ponton Street | COU | 150/91 | 400 | | CEN | Pre-let | | |
| 1992 | 10, Beaverhall Road | COU | 2381/90 | 237 | | CEN | Pre-let | | |
| 1992 | Charlotte Square West (West Register House) | COU | C14/91 | | | CEN | Pre-let | | CDD entry says floorspace NA. Don't understand why. |
| 1992 | Dean Street (St Bernards Ch Hall) | COU | 2878/90 | 296 | | CEN | Pre-let | | |
| 1992 | 123, Princes St/33, Rose St Lane | COU | 2121/91 | 1,295 | | CEN | Pre-let | | Applicant & occupant British Gas |
| 1992 | 18-20, Abercromby Place | COU | 2698/91 | 410 | | CEN | Pre-let | | Applicant & occupant Mactaggart & mickel |
| 1992 | 6, Washington Lane | COU | 2188/90 | 475 | | CEN | Spec | | |
| 1992 | 4, Damaway Street | COU | 1730/88 | 386 | | CEN | Spec | | |

# Appendix 10 Summary of new builds and change of use

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | 6, Grosvenor Street | COU | 865/90 | 626 | 4,395 | | CEN | Spec | | |
| 1992 | 1, Dock Street | COU | 1493/92 | 1,225 | | | NEE | Pre-let | | |
| 1992 | Bonnington Bond, Bonn Road Ph 2 | COU | 1853/89 | 4,500 | | | NEE | Spec/PL | | CDD lists as complete 1991 Building warrant not raised until 1992. |
| 1992 | 46, The Shore | COU | 1702/91 | 1,022 | | | NEE | | | COU completed 1992 |
| | | | | | 6,747 | | | | | |
| | | | | | 11,142 | NIL | | | | |
| 1993 | 10, George Street | New | 20/90 | 16,168 | | | CEN | Pre-let | | Planning data suggests 7,000m2. |
| 1993 | 19, St Andrews Square | New | 416/91 | 560 | | | CEN | Purpose | | Building control entry is alter and extend offices. Scottish Life. |
| 1993 | 3 (4), North St Andrews Street | New | 917/89 | 2,542 | | | CEN | Spec | | Guardian Royal occupy Refurbishment completed June 1997 |
| 1993 | 3/4, Gayfield Square | New | 1090/89 | 950 | 20,220 | | CEN | Spec | | |
| 1993 | Fishwives Causeway | New | 783/92 | 4,500 | | | NEE | Purpose | | Scottish Power |
| 1993 | 96, Clermiston Road | New | 2770/91 | 834 | | | NWE | Purpose | | Building control entry is extend offices. Kingston SCL |
| 1993 | 222, Queensferry Road | New | 1109/92 | 380 | | | NWE | Purpose | | Building control entry is extend offices Capital Foods |
| 1993 | Enterprise Building, Riccarton Campus | New | 278/92 | 900 | | | RWE | Purpose | | Heriot-Watt |
| 1993 | 18/22, Lanark Road | New | 2067/91 | 325 | | | SWE | Purpose | | Benefit Systems |
| 1993 | 42, Craiglockhart Ave | New | 2531/90 | 1,228 | | | SWE | Spec | | |
| | | | | | 8,167 | | | | | |
| | | | | | 28,387 | NIL | | | | |
| 1993 | 17, Dublin Street | COU | 182/93 | 300 | | | CEN | Pre-let | | |
| 1993 | 17, George 4 Bridge | COU | 547/92 | 480 | | | CEN | Pre-let | | Faculty of Advocates |
| 1993 | 172, High Street | COU | 905/91 | 1,744 | | | CEN | Pre-let | | Faculty of Advocates |
| 1993 | 1, Castle Terrace | COU | 127/92 | 1,254 | | | CEN | Spec | | |
| 1993 | 1/3, Mansfield Place | COU | 725/91 | 405 | 4,183 | | CEN | Spec | | |
| 1993 | 5, Giles Street | COU | 1316/93 | 415 | | | NEE | Spec | | |
| 1993 | 3-23, Leith Walk | COU | 303/91 | 343 | | | NEE | Spec | | |
| 1993 | 12, Bankhead Crossway South (Bank of Scotland) | COU | 1868/92 | 1,250 | | | SWE | Purpose | | Bank of Scotland |
| | | | | | 2,008 | | | | | |
| | | | | | 6,191 | NIL | | | | |
| 1994 | 39-41, George Street | New | 6863/90 | 2,863 | | | CEN | Spec | | |
| 1994 | 114-116, George Street | New | 2326/91 | 4,000 | | | CEN | Spec | | |
| 1994 | Captains road (407) | New | C29/93 | 4,480 | 6,863 | | SEE | Purpose | Y | Edinburgh District Council |
| 1994 | 55, Buckstone Terrace | New | 1833/93 | 1,400 | | | SWE | Purpose | Y | Lothian Regional council |
| 1994 | Bankhead Drive (General reposter of Scotland) | New | C35/92 | 7,840 | | | SWE | Purpose | | Thomas Thompson House Corner of Bankhead Dr/Bankhead Xway North |
| 1994 | 599, Calder Road (Pentland Gait Phase 1) | New | 2953/92 | 1,564 | | | SWE | Spec | Y | BC entry is erect office. EDI involved. |
| | | | | | 15,284 | | | | | |
| | | | | | 22,147 | 7,444 | | | | |
| 1994 | St Giles Street | COU | 814/91 | 230 | | | CEN | Other | | |
| 1994 | 148, Pleasance | COU | 2150/93 | 2,380 | | | CEN | Pre-let | | Lothian Health |
| 1994 | 63, Northumberland Street | COU | 691/91 | 300 | | | CEN | Pre-let | | CDD also includes as COU in 1992. This entry has been ignored |
| 1994 | 200, Cowgate | COU | 212/93 | 500 | | | CEN | Purpose | | Edinvar Housing association |
| 1994 | 3-4, Hunters Square | COU | 1928/92 | 700 | 4,110 | | CEN | Spec | Y | Applicant & occupant EDI |
| 1994 | 57, Constitution Street | COU | 2050/91 | 860 | | | NEE | Pre-let | | |
| 1994 | 9, Maritime Street | COU | 1003/94 | 520 | | | NEE | Pre-let | | |
| 1994 | 42, Maritime Street | COU | 2068/90 | 492 | | | NEE | Spec | | |
| 1994 | Tower Place, Queens Quay | COU | 531/91 | 610 | | | NEE | Spec | | |
| 1994 | 18-19, Shore Place | COU | 1991/92 | 240 | | | NEE | Spec | | |
| 1994 | 31, The Loan, South Queensferry | COU | 2325/93 | 1038 | | | RWE | Purpose | | Wheatsheaf Catering |
| 1994 | Oxgangs Path | COU | 2928/92 | 340 | | | SWE | Pre-let | | |
| | | | | | 4,100 | | | | | |
| | | | | | 8,210 | 700 | | | | |
| 1995 | Morrison Street (Lothian Road), Conference Centre | New | 639/92 | 11,214 | | | CEN | Purpose | Y | Not strictly offices. |
| 1995 | 1, Tobago Place/148-156, Morrison St (Conference House) | New | 1680/92 | 3,979 | | | CEN | Spec | Y | |
| 1995 | Stanhope Street | New | 2387/91 | 594 | | | CEN | Spec | | |
| 1995 | 7, Castle Street | New | 1030/92 | 4,223 | 20,010 | | CEN | Spec | | |
| 1995 | Victoria Dock (Scottish Office) | New | 1187/92 | 32,515 | | | NEE | Purpose | | Scottish Office. Developed by Forth Ports. |
| 1995 | Duddingston Park South | New | 1689/93 | 320 | | | SEE | Purpose | Y | Offices & storage buildings. Lothian Regional Council |
| 1995 | 599, Calder Road (Pentland Gait Phase 2) | New | 2026/94 | 2,820 | | | SWE | Spec | Y | BC entry is erect two office blocks. EDI involved |
| 1995 | Edinburgh Park Site D2, John Menzies | New | 1132/94 | 4,150 | 3,806 | | ED Park | Purpose | Y | John Menzies The NFA come from the Edinburgh Park news letter |
| 1995 | Edinburgh Park, Site D1 ICL | New | 2735/93 | 3,420 | 2,974 | | ED Park | Purpose | Y | ICL Purpose built based on eqi Focus July 1995 NFA from Ed Pk newsle |
| 1995 | 10, Lochside Place (Site C1 Lochside Ct Ph 1) | New | 1012/94 | 3,205 | 2,787 | | ED Park | Spec | Y | British Energy bldg. NFA from Ed Pk newsletter |
| | | | | | 10,775 | | | | | |
| | | | | | 66,440 | 29,108 | | | | |
| 1995 | 11, Albany Street | COU | 376/91 | 380 | | | CEN | Pre-let | | |
| 1995 | 42, South Oswald Road | COU | 1287/93 | 346 | | | CEN | Purpose | | Royal College of Nursing |
| 1995 | 65 Frederick Street | COU | 2128/95 | 320 | 1,046 | | CEN | Purpose | | Balfour & Manson occupants |
| 1995 | 62-64 Commercial Street | COU | 2715/94 | 5,505 | | | NEE | Spec | | COU to offices, bars & shops |
| 1995 | 4, Marine Drive | COU | 110/95 | 2,500 | 8,005 | | NWE | Purpose | | Note also the entry for new build in 1990 British Gas. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 9,051 | NIL | | | | |
| 1996 | 30, Lothian Road | New | 85/93 | 31,288 | | | | CEN | Purpose | Y | Standard Life Building Floorspace confirmed ecl Focus July 1995 |
| 1996 | Dundee Street | New | 1100/91 | 7,050 | | | | CEN | Purpose | | BC entries unclear CDD entries relate to S&N offices. S&N |
| 1996 | 126, Canongate | New | 1507/94 | 892 | | 39,230 | | CEN | Spec | | |
| 1996 | 1-2, Lochside Crescent (Edinb'gh Park, Scottish Equitable) | New | 2708/92 | 26,725 | 23,238 | 26,725 | | ED Park | Purpose | Y | Scottish Equitable The GFA from CDD data was 32,371 |
| | | | | | | 65,955 | 58,013 | | | | |
| 1996 | 7,Atholl Place | COU | 1030/96 | 485 | | | | CEN | Purpose | | |
| 1996 | 46, Millar Crescent | COU | 840/95 | 555 | | 1,040 | | CEN | Purpose | | |
| | | | | | | 1,040 | NIL | | | | |
| 1997 | 50, Lothian Road (Clydesdale Bank Plaza) | New | 755/95 | 10,150 | 8,825 | | | CEN | Spec | Y | CDD GFA is 27,100m2 (Ph1-3?) Rydens have 8,825 for Ph1 Ph2 is 6,3( |
| 1997 | 126 George Street | New | 1706/95 | 5,030 | | | | CEN | Spec | | ) Entered as new build as per the CDD list. |
| 1997 | 127-129, George Street | New | 1688/95 | 4,320 | | 19,500 | | CEN | Spec | | ) |
| 1997 | 5, John's Place | New | 1697/95 | 210 | | | | NEE | Pre-let | | New build on CDD list. Date of completion uncertain. |
| 1997 | 62-66, George Street | New | 134/96) | 880 | | | | CEN | Spec | | Standing Order' around floor, refurbished offices above. |
| 1997 | 41, Roseburn St (16, Russel Rd) | New | 2897/96 2891/93 | 300 | | | | CEN | | | |
| 1997 | 11-19, West Port | New | 2655/88/51 | 100 | | | | CEN | | | No record on CDD list Assume completion 1997 Check details. |
| 1997 | 11, Walker Street | New | 255/92 | 524 | | 2,014 | | CEN | Unknown | | Applicant Prudential Property |
| 1997 | Plot E1 , Edinburgh Park (Kingston SCL) | New | 541/96 | 4,275 | 3,718 | | | ED Park | Pre-let | Y | The GFA from CDD was 6,600 |
| 1997 | Edinburgh Park, Plot C2 (11/12,Lochside Court) | New | 1875/95 | 4,330 | 3,764 | 8,605 | | ED Park | Spec | Y | Midland Bank Bldg |
| | | | | | | 30,119 | 18,755 | | | | |
| 1997 | Salisbury Place | COU | 1995/92 | 5,744 | | | | CEN | Pre-let | | BC data used |
| 1997 | Bakehouse Close | COU | 2043/96 | | | | | | | | |
| 1998 | Bakehouse Close | New | 2043/96 | N/A | | | | CEN | Spec | | |
| 1998 | 17, Gayfield Square | New | 2773/91 | 300 | | | | CEN | Spec | | |
| 1998 | Haymarket Court | New | 113/95 | 13,000 | | | | CEN | Pre-let | | See reconciliation Occupiers Inland Revenue. |
| 1998 | Scottish Widows, Port Hamilton | New | 2542/94 | 32,807 | | | | CEN | Purpose | | |
| 1998 | 22-26 George Street | New | NK | 2,323 | | 48,230 | | CEN | | | Complete refurb of RSE building. |
| 1998 | 7a, South Gyle Broadway | New | 2439/96 | 8,940 | | | | NoWE | Pre-let | Y | S&N Land Provision by City |
| 1998 | 5, John's Place | New | 1697/95 | 210 | | | | NEE | Purpose? | | |
| 1998 | Heros Building, South Gyle Park, South Gyle Crescent | New | NK | 3,790 | 3,294 | | | NoWE | Spec | Y | Land provision by City NFA from Signage |
| 1998 | Bond 42, Commercial St | New | 535/96 | 2,521 | | | | NEE | Spec | | Assume completed 1998 |
| 1998 | South Gyle Park, S Gyle Crescent | New | NK | 2,025 | 1,760 | 17,486 | | NoWE | Spec | | Possibly refers to the blue fronted offices in Sth Gyle Park |
| | | | | | | 65,716 | 10,965 | | | | |
| 1999 | Plot A2 Edinburgh Park (BT) | New | 185/95 | 12,830 | 11,154 | | | ED Park | Purpose (Pre-sale) | Y | BT building |
| 1999 | Plot D3 Edinburgh Park (SEAM) | New | NK | 9,085 | 7,900 | | | ED Park | Purpose (Pre-sale) | Y | Originally pre-sale to ADOBE.Now Scottish Equitable Asset Management |
| 1999 | Plot G2 Edinburgh Park (HQ Business Centres)- 3 Lochside W | New | NK | 2,510 | 2,184 | | | ED Park | Pre-let | Y | |
| 1999 | Plot G3 Edinburgh Park, 1&2, Lochside Way | New | NK | 4,490 | 3,904 | | | ED Park | Spec | Y | 1580 let to Telewest, 2324 let to HSBC Global Fund Services |
| 1999 | Plot E2 Edinburgh Park, Crammond House (HQ Building) | New | NK | 3,611 | 4,150 | 32,526 | | ED Park | Spec | Y | Let to Oracle UK. |
| 1999 | Redheughs Ave | New | NK | 10,910 | 9,485 | | | NoWE | Purpose | Y | Royal Bank of Scotland extension. |
| 1999 | Vantage Point, 24, St John's Road | New | 216/97 | 1,670 | 1,450 | | | NoWE | NK | | |
| 1999 | Plot F1 Edinburgh Park (F1 Group) | New | NK | 3,475 | 3,020 | | | NoWE | Pre-let | Y | |
| 1999 | Cornerstone | New | NK | 3,740 | 3,251 | | | NoWE | Spec | Y | Aberdeen Asset Managers own - See Ryden April 99 |
| 1999 | Site G1 Edinburgh Park, 4-5, Lochside Way PRELET TO UDV | New | NK | 4,275 | 3,718 | 24,070 | | NoWE | Pre-let to UDV | Y | |
| 1999 | Caledonian Exchange, Canning Street | New | NK | 8,410 | 5,574 | | | CEN | Pre-let to Standard Life | | Rebuild on existing shell. |
| 1999 | 3, George St/St Andrews Sq | New | NK | 4,645 | | | | CEN | | | Refurbishment by Standard Life. |
| 1999 | Canning House, 10 Canning Street | New | NK | 5,200 | | 16,255 | | CEN | | | Refurbishment of older block (data from SPN). |
| | | | | | | 72,851 | 54,926 | | | | |
| 2000 | Holyrood Road | New | 2606/96 99/1304 | 12,000 | | | | CEN | Purpose | | Scotsman Publications. Floorspace data from SPN. |
| 2000 | Exchange Crescent Ph 1b West Approach Road | New | NK | 12,390 | 10,776 | | | CEN | Pre-sale to Standard L | Y | Started June 1998 Floorspace source Bruce donaldson |
| 2000 | 26-28, Charlotte Square/Hope St Lane | New | 1365/94 | 1,917 | | | | CEN | Spec | | |
| 2000 | Edinburgh One, Conference Sqare (Morrison Street) | New | NK | 5,016 | | | | CEN | Pre-let | | Pre-let to Scottish Widows. |
| 2000 | 40 Torphichen Street | New | NK | 6,970 | | | | CEN | Spec | | Planning data. |
| 2000 | 97 George St | New | Nk | 1806 | | | | CEN | | | Scotsman report Oct 99 |
| 2000 | Atholl Exchange, Canning Street | New | NK | 930 | | | | CEN | Spec? | | FOCUS Data |
| 2000 | 12-13, St Andrews Square/2-6 George St | New | 2687/93 03226/97 | 2,504 | | | | CEN | Pre-let | | Data from planning /SPN Demolition & rebuild behind facade. |
| 2000 | 23-23a, St Andrews Sq | New | 1545/96 | 2,350 | | | | CEN | Pre-let | | |
| 2000 | 24 - 25 St Andrews Sq | New | NK | 2,700 | | | | CEN | NK | | ecl data |
| 2000 | CA House 21 Haymarket Yard | New | NK | 3251 | | | | CEN | | | SPN Data |
| 2000 | Exchange Crescent Ph 1c, West Approach Road | New | NK | 10,700 | | | | CEN | le (pre-let?) to Stand. | Y | SPN Floorspace data. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | Princes Exchange | New | NK | 16135 | 14 030 | | | CEN | Spec? | | |
| 2000 | 20 Union Street | New | NK | 993 | | | | CEN | | | SPN Data |
| 2000 | Wetsfield House, Westfield Road | New | NK | 5.225 | 4.543 | | | CEN | Spec? | | Details taken from site board |
| 2000 | 9-10 St Andrews Square | New | NK | 3 345 | | 88.232 | | CEN | | | SPN data.Refurb behind facade. |
| 2000 | The Forthstone, South Gyle Park | New | NK | 3.790 | 3.298 | | | NoWE | Spec? | Y | Details taken from Site board |
| 2000 | Sirius Building, Clock Tower Development Sth Gyle | New | NK | 2250 | | | | NoWE | Spec | Y | EDI |
| 2000 | Vega Building, Clock Tower Development Sth Gyle | New | NK | 2571 | | | | NoWE | Spec | Y | EDI |
| 2000 | West Point, 4 Redheughs Rigg | New | NK | 3.750 | 3.263 | | | NoWE | Spec? | | Demolition and replacement |
| 2000 | The Broadstone, Sth Gyle Park | New | NK | 3.950 | 3.437 | 18 311 | | NoWE | Spec | Y | |
| 2000 | Site F2 Edinburgh Park taken by the HALIFAX | New | NK | 5.880 | 5.112 | 5.880 | | ED Park | Spec | Y | |
| | | | | | | 110 423 | 41 531 | | | | |

**APPENDIX 11.**

# Rental data 1985 to 2000

| | Modern city centre open plan | | | | | Modern open plan business parks | | | | | Refurbished town houses | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year/Month | RICS periodic | Scottish Property Market Report | Ryden Periodic | Ryden, 1995 | Average Rent £/ft2 | RICS periodic | Scottish Property Market Report | Ryden Periodic | Ryden, 1995 | Average Rent £/ft2 | RICS periodic | Scottish Property Market Report | Ryden Periodic | Ryden, 1995 | Average Rent £/ft2 |
| 1985/10 | | | | 7.5 | 7.5 | | | | | | | | | | |
| 1986/10 | | | | 7.8 | 7.8 | | | | | | | | | | |
| 1987/4 | | | 7.75 | | 7.75 | | | | | | | | 7.5 | | 7.5 |
| 1987/10 | | | 10.75 | 10.4 | 10.575 | | | 7.25 | | 7.25 | | | 8.5 | | 8.5 |
| 1988/4 | | | 10.5 | | 10.5 | | | | | | | | | | |
| 1988/10 | | | 14 | 13.5 | 13.75 | | | | | | | | 13 | | 13 |
| 1989/3 | | | 17 | | 17 | | | | | | | | | | |
| 1989/10 | | | 18.5 | 17.8 | 18.15 | | | 12 | | 12 | | | | | |
| 1990/10 | | | 23.5 | 25 | 24.25 | | | | | | | | 21 | | 21 |
| 1991/4 | | | 20.5 | | 20.5 | | | | | | | | | | |
| 1991/10 | | | 24 | 22.8 | 23.4 | | | | | | | | 19 | | 19 |
| 1992/4 | | | 23 | | 23 | | | | | | | | | | |
| 1992/10 | | | | 21.6 | 21.6 | | | | | | | | | | |
| 1993/2 | 18.14 | | | | 18.14 | 14.2 | | | | 14.2 | 13.98 | | | | 13.98 |
| 1993/4 | | | | | | | | 13 | | 13 | | | | | |
| 1993/10 | | | 19 | 20 | 19.5 | 14.04 | | | | 14.04 | | | 11.5 | | 11.5 |
| 1993/12 | 17.96 | | | | 17.96 | | | | | | 13.13 | | | | 13.13 |
| 1994/3 | 18.43 | | | | 18.43 | 14.27 | | | | 14.27 | 13.09 | | | | 13.09 |
| 1994/4 | | | 19.5 | | 19.5 | | | 13 | | 13 | | | | | |
| 1994/10 | | | 19 | 20 | 19.5 | | | 13.25 | | 13.25 | | | | | |
| 1994/12 | 17.96 | | | | 17.96 | 14.43 | | | | 14.43 | 12.83 | | | | 12.83 |
| 1995/3 | 18.21 | | | | 18.21 | 14.58 | | | | 14.58 | 13.15 | | | | 13.15 |
| 1995/4 | | | 19 | | 19 | | | 13.25 | | 13.25 | | | | | |
| 1995/6 | | 21 | | | 21 | | | 14 | | 14 | | | | | |
| 1995/10 | | | | 20 | 20 | | | | | | | | | | |
| 1995/12 | 17.11 | | | | 17.11 | 14.75 | | | | 14.75 | 12.57 | | | | 12.57 |
| 1996/3 | 16.63 | | | | 16.63 | 15.13 | | | | 15.13 | 12.53 | | | | 12.53 |
| 1996/4 | | | 18.5 | | 18.5 | | | 12.5 | | 12.5 | | | | | |
| 1996/6 | 16.92 | 18.5 | | | 17.71 | 15.3 | | | | 15.3 | 12.45 | | | | 12.45 |
| 1996/9 | 17.06 | | | | 17.06 | 15.48 | | | | 15.48 | 12.73 | | | | 12.73 |
| 1996/12 | 17.13 | | | | 17.13 | 15.48 | | | | 15.48 | 12.68 | | | | 12.68 |
| 1997/3 | 17.38 | | | | 17.38 | 15.73 | | | | 15.73 | 12.7 | | | | 12.7 |
| 1997/6 | 17.93 | 18.5 | | | 18.215 | 16.16 | | | | 16.16 | 12.85 | | | | 12.85 |
| 1997/9 | 18.68 | | | | 18.68 | 16.23 | | | | 16.23 | 13.03 | | | | 13.03 |
| 1997/10 | | | 21.5 | | 21.5 | | | 15.5 | | 15.5 | | | | 13.5 | 13.5 |
| 1997/12 | 19.25 | | | | 19.25 | 16.3 | | | | 16.3 | 13.32 | | | | 13.32 |
| 1998/3 | 20.08 | | | | 20.08 | 16.73 | | | | 16.73 | 13.38 | | | | 13.38 |
| 1998/4 | | | 23.5 | | 23.5 | | | 16.5 | | 16.5 | | | | 14.5 | 14.5 |
| 1998/6 | 21.65 | | | | 21.65 | 17.35 | | | | 17.35 | 14.21 | | | | 14.21 |
| 1998/9 | 22 | | | | 22 | 17.64 | | | | 17.64 | 14.5 | | | | 14.5 |
| 1998/11 | | | | | | | | 18.5 | | 18.5 | | | | 16.5 | 16.5 |
| 1998/12 | 22.46 | | | | 22.46 | 18.17 | | | | 18.17 | 15.04 | | | | 15 04 |
| 1999/3 | 22.81 | | | | 22.81 | 18.53 | | | | 18.53 | 15.27 | | 15 | | 15.135 |
| 1999/4 | | | 23.75 | | 23.75 | | | 19.5 | | 19.5 | | | | | |
| 1999/6 | 23.39 | | | | 23.39 | 19.25 | | | | 19.25 | 15.86 | | | | 15.86 |
| 1999/9 | 23.56 | | | | 23.56 | 21.33 | | | | 21.33 | 16.39 | | | | 16 39 |
| 2000/3 | 26.04 | | | | 26.04 | 22.96 | | | | 22.96 | 16.63 | | | | 16.63 |
| 2000/6 | 27.13 | | | | 27.13 | 23 | | | | 23 | 16.81 | | | | 16.81 |
| 2000/9 | 28.09 | | | | 28.09 | 23.68 | | | | 23.68 | 16.89 | | | | 16.89 |
| 2000/12 | 27.69 | | | | 27.69 | 23.46 | | | | 23.46 | 17.02 | | | | 17.02 |

## APPENDIX 12 EDINBURGH OFFICE OCCUPIER SURVEY

Point of Contact:
E.A.Trevillion
Department of Building Engineering and Surveying
Heriot-Watt University
Riccarton
EH14 4AS

The results of this survey will be used for research purposes only. It is the intention to publish statistical analyses of the results. However, individual data will be treated as confidential and will not be disclosed to third parties.

| (1) PROPERTY & OCCUPIER DETAILS | | | | | | |
|---|---|---|---|---|---|---|
| *Name of occupier* | | | | | | |
| *Address of premises* | | | | | | |
| | Post code | | Phone Number | | | |
| *Approximate Total Floorspace occupied (m2)* | | | | | | |
| *Do you occupy part of a multi-occupied building* | YES | NO | | | | |
| | | | | | | |
| *Do you sub-let any part of your premises. If yes, can you give an estimate in m2 of the part which is sub-let* | YES | NO | m2 | | | |
| | | | | | | |
| *Approximate age of the building (please tick)* | <5 years | 5-10 years | 11-20 years | 20-50 years | >50 years | |
| | | | | | | |
| *Number of Staff employed in premises* | | | | | | |
| *Is your premises (please tick):* | A headquarters building | | | | | |
| | Regional office | | | | | |
| | Sole premises | | | | | |
| | Other (specify | | | | | |

| (2) BUSINESS OPERATIONS | | | | | |
|---|---|---|---|---|---|
| *Business sector:* | | | | | |
| *Manufacturing (SIC Cat D)* | | | | | |
| *Electricity, Gas and Water Supply (SIC Cat E)* | | | | | |
| *Construction (SIC Cat F)* | | | | | |
| *Wholesale and Retail Trade (SIC Cat G)* | | | | | |
| *Transport, Storage & Communication (SIC Cat I)* | | | | | |
| *Financial Intermediation (SIC Cat J - banking, insurance* | | | | | |
| *& pension funding, fund management)* | | | | | |
| *Real Estate Related Services (SIC Cat K70)* | | | | | |
| *Research & development (SIC Cat K73)* | | | | | |
| *Legal Services/Solicitors (SIC Cat K74)* | | | | | |
| *Business Services Accounting(SIC Cat K74)* | | | | | |
| *Business Services Other (SIC Cat K74)* | | | | | |
| *Public Administration (SIC Cat L)* | | | | | |
| *Education (SIC Cat M)* | | | | | |
| *Health & Social Work (SIC Cat N)* | | | | | |
| *Other Community, Social and Personal Service Activities (SIC Cat O)* | | | | | |
| *Activities not Classified Elsewhere (specify)* | | | | | |
| | | | | | |
| *Turnover* | ‹£1m | £1-10m | £10-100m | ›£100m | |
| | | | | | |
| *Type of Company* | Public Limited Company | Private Limited Company | Partnership | Other (Specify) | |
| | | | | | |
| *Area of business operations (please tick)* | Limited to Edinburgh and or the Central belt | Limited to Scotland | UK Wide | International | |
| | | | | | |

| (3) OWNER OCCUPATION AND LEASEHOLD ISSUES<br>The aim of this section is to examine ownership patterns and the why occupiers choose to either own the business premises they occupy (retain the feuhold interest) or rent their property (retain a leasehold interest only). | | | |
|---|---|---|---|
| *Do you consider property to be an asset and/or a cost* | Asset | Cost | |
| | | | |
| *Do you own or rent the property you occupy* | OWN | RENT | |
| | | | |

**If you OWN your premises go to 3.1**

**If you RENT your premises go to 3.2**

### 3.1 OWNER/OCCUPIERS

| | | | | | |
|---|---|---|---|---|---|
| *How long have you occupied your present premises. (please tick)* | <5 years | 5-10 years | 11-15 years | >15 years | |
| | | | | | |
| *Is it company policy to own its own premises* | YES | NO | | | |
| | | | | | |
| *If it is NOT company policy to own premises can you explain briefly why your business prefers to rent premises* | | | | | |
| *Did you (please tick):* | Commission your building | Purchase a ready made building | | | |
| | | | | | |
| *To what extent did market rental values influence your decision to purchase rather than rent.* | Strongly | | | | Not at all |
| | 6 | 5 | 4 | 3 | 2 | 1 |
| *To what extent did capital price influence your decision to purchase the present property* | Strongly | | | | Not at all |
| | 6 | 5 | 4 | 3 | 2 | 1 |
| *What other factors influenced you to buy the present property* | Location | | | | |
| | Quality | | | | |
| | Availability | | | | |
| | Flexible work space | | | | |
| | Availability of skilled labour | | | | |
| | Good transport communications | | | | |
| | Serviced building/facilities management | | | | |
| | Car parking | | | | |
| | Other (specify) | | | | |
| *When you moved to your current premises, would you have considered renting as an alternative if your capital outlays had been greater by the following amounts* | (+)10-20% | (+)20-30% | (+)30-50% | (+)50% | Never |
| | | | | | |
| *What other factors would influence you to rent rather than buy (Please rank in order. 1 highest)* | Availability of the right sort of building | | | | |
| | Location | | | | |
| | Impact of a capital asset on your business (eg gearing cost of capital, balance sheet implications | | | | |
| | Risk | | | | |
| | Mobility | | | | |
| | On going cost | | | | |
| | Lease terms | | | | |
| | Other (specify) | | | | |

### 3.2 LEASEHOLDERS

| | | | | | | |
|---|---|---|---|---|---|---|
| *How long have you occupied your present premises. (please tick)* | <5 years | 5-10 years | 11-15 years | >15 years | | |
| | | | | | | |
| *What % of your turnover is represented by rent* | % | | | | | |
| *What is the length of your lease (YEARS)* | | | | | | |
| *How many years has it to run (YEARS)* | | | | | | |
| *Does your lease contain break clauses* | | | | | | |
| *What do you perceive as the ideal lease length* | YEARS | | | | | |
| *When was your last rent review* | <1 year ago | 1-3 years ago | 3-5 years ago | | >5 years ago | |
| *To what extent did rental value influence your decision to rent the present property* | Strongly | | | | | Not at all |
| | 6 | 5 | 4 | 3 | 2 | 1 |
| *What other factors influenced your decision to rent the present premises* | Location | | | | | |
| | Quality | | | | | |
| | Flexible work space | | | | | |
| | Availability of skilled labour | | | | | |
| | Good transport communications | | | | | |
| | Serviced building/facilities management | | | | | |
| | Car parking | | | | | |
| | Other (specify) | | | | | |
| *Compared to current market rental values, what is the maximum increase in rent you would be prepared to pay to stay in your present premises.* | 10-20% | 20-30% | 30-50% | >50% | Not an issue | |
| | | | | | | |
| *What increase in rent (compared to your current rent) would influence you to buy rather than rent your premises.* | 10-20% | 20-30% | 30-50% | >50% | Not an issue | |
| | | | | | | |
| *Is it company policy to rent premises.* | YES | NO | | | | |
| *Do you perceive ownership as unattractive* | YES | NO | | | | |
| *If yes, why* | | | | | | |

| | | | |
|---|---|---|---|
| *What other factors would influence you to buy rather than rent.(Please rank in order. 1 highest)* | Availability of the right sort of building | | |
| | Location | | |
| | Impact of a capital asset on your business (eg gearing cost of capital, balance sheet implications | | |
| | Risk | | |
| | Mobility | | |
| | On going cost | | |
| | Lease terms | | |
| | Stability of ownership (eg better prediction of on going costs and reduced susceptibility to change in rental value) | | |
| | Lease terms | | |
| | Investment value of owned property | | |
| | Opportunity to bespoke build | | |
| | Other (Specify) | | |

## (4) OCCUPIER DEMAND ISSUES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| The aim of this section is to examine changes in occupier demand and the extent to which your demand requirements were met by your present premises. | | | | | | | |
| *Have you occupied the building from new* | YES | NO | | | | | |
| *Did you have an input into the layout/design of the building before occupation (including refurbished buildings occupied immediately following refurbishment)* | YES | NO | | | | | |
| *Are you dissatisfied with the existing building* | YES | NO | | | | | |
| *If you are dissatisfied with the existing property, indicate the main areas of dissatisfaction (Please rank in order 1 highest):* | Age | | | | | | |
| | Design (unsuitable for modern office practices) | | | | | | |
| | Lease terms | | | | | | |
| | Location | | | | | | |
| | Space requirements | | | | | | |
| | IT Requirements | | | | | | |
| | Statutory restrictions on expansion | | | | | | |
| | Compliance with the Disability Discrimination Act 1995 | | | | | | |
| | Facilities management | | | | | | |
| | Car parking | | | | | | |
| | Common services | | | | | | |
| | Other (specify) | | | | | | |
| *If you are dissatisfied with the existing property, indicate the main reasons for remaining (Please rank in order. 1 highest)* | Lease terms (if leaseholder) | | | | | | |
| | Availability of suitable stock | | | | | | |
| | Cash flow/funding related issues | | | | | | |
| | Human resource availability (present compared to possible future) | | | | | | |
| | Other (specify) | | | | | | |
| *Are your space requirements likely to change in the next 3yrs.* | YES | NO | | | | | |
| | | | | | | | |
| *If yes how?* Reduce by | 5-10% | 10-20% | 20-30% | 30-50% | | | |
| Increase by | 5-10% | 10-20% | 20-30% | 30-50% | | | |
| *How long do you expect to remain in the present building (please tick)* | 3yrs | 3-5yrs | 10yrs | >10yrs | Don't know | | |
| | | | | | | | |
| *What reasons would cause you to move from your present building (Please rank in order. 1 highest)* | More modern accommodation requirements | | | | | | |
| | Business expansion (additional space requirements) | | | | | | |
| | Business contraction(reduced space requirements) | | | | | | |
| | Location | | | | | | |
| | Image | | | | | | |
| | Competitor behaviour (Specify) | | | | | | |
| | Rent (if leaseholder) | | | | | | |
| | Other (Specify) | | | | | | |
| *Do you currently use hot desking/home working as a means of reducing space requirements* | YES | NO | | | | | |
| *Are you likely to employ such techniques in the next 5 years* | YES | NO | | | | | |

## (5) PROPERTY MANAGEMENT ISSUES

| | | | | | | |
|---|---|---|---|---|---|---|
| *Do you have an in-house property team/manager* | YES | NO | | | | |
| *How are property decisions made* | Board level | | | | | |
| | Partner level | | | | | |
| | In house property team advice | | | | | |
| | Outside consultants/property professionals | | | | | |
| | Top down | | | | | |
| | Bottom up | | | | | |
| | Other (Specify) | | | | | |
| *Does your company have a strategy for its property operations* | YES | NO | | | | |
| | | | | | | |
| *If you have a strategy for property how would you best describe your strategic approach* | Supporting business operations | | | | | |
| | Property cost minimisation and/or revenue maximisation | | | | | |
| | Combination | | | | | |
| | Property asset maximisation | | | | | |
| | Other (specify) | | | | | |
| *What factors do you consider important when making property decisions (please score):* | Important | | | | | Not important |
| *Operational efficiency* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Overall costs* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Location* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Utilisation of space* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Investment value* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Image* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Access to skilled labour market* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Owner occupation vs. rent* | 6 | 5 | 4 | 3 | 2 | 1 |
| *Other (specify, and please score 1 to 5)* | | | | | | |
| *What are your main sources of information when making property decisions (Please rank in order. 1 highest)* | Agents | | | | | |
| | Word of mouth | | | | | |
| | In-house property team | | | | | |
| | Commissioned research from agents | | | | | |
| | Commissioned research from independent consultants | | | | | |
| | On going information from Chartered Surveyors | | | | | |
| | Property press | | | | | |
| | Published research | | | | | |
| | Other (specify) | | | | | |
| *If the decision was made to move or acquire additional property, who would be the principal sources of advice and/or project management* | Agents | | | | | |
| | In-house property team | | | | | |
| | Commissioned research from agents | | | | | |
| | Commissioned research from independent consultants | | | | | |
| | Chartered Surveyors | | | | | |
| | Other (specify) | | | | | |
| **Would you agree to a follow up interview if required** | YES | | NO | | | |

**APPENDIX 13**

# The City of Edinburgh's development agents

## THE EDI GROUP

The EDI group was originally set up as Enterprise Edinburgh in June 1988, primarily to work up the Edinburgh Park scheme. Its main remits were to (Wall, 1998):

- Acquire land.
- Work up the Edinburgh Park scheme.
- Appoint and oversee the architect for the scheme.

It is a privatised, profit making development organisation at arms length to the Council *but* wholly owned by it, and has a wide range of development interests[1]. The City of Edinburgh Council continues to be represented on the Board. EDI is viewed as a resource that can be used by the Council for developing the City. It very rarely works isolation and over the years has built up a network of relationships with other partners. Joint ventures include *New Edinburgh Ltd,* a company formed by EDI and the Miller Group in January 1991 to drive forward the development of Edinburgh Park. The EDI corporate strategy is to focus on four principle areas (EDI News, 1997):

- Property development
- Investment and management
    - Area based planning and economic development

- Employment

In the context of the Edinburgh Park scheme, at different times EDI has operated in the role of traditional developer (with New Edinburgh Ltd.) and as landowner (as agent for the City of Edinburgh Council). In these roles it has variously led the process of site assembly, interfaced with the City's planning department, architects and construction companies and has lead the development of many of the buildings in the Park. It has also acted on behalf of the City selling parcels of land for development by others e.g. the parcel sold to Scottish Equitable in Phase 1 of the scheme.

**EDINBURGH INTERNATIONAL CONFERENCE CENTRE LTD.**

EICC Ltd was incorporated on 13 May 1991 (Wilson, 2000). The founding partners were the then Edinburgh District Council, Lothian and Edinburgh Enterprise Ltd. (LEEL-the local enterprise council) and Lothian Regional Council. With the formation of unitary authorities in 1996 the main shareholders became the new City of Edinburgh Council and LEEL (Lothian Regional Council ceased to exist). LEEL redeemed its redeemable preference shares on 17 December 1996 and on that date The City of Edinburgh Council became the ultimate holding organisation of the company. In December 1996 the company became a subsidiary of CEC Holdings Ltd., which in turn is a subsidiary of The City of Edinburgh Council.

The company was set up to, "...principally, construct and operate the Edinburgh Conference Centre and to develop the 9 acre site in Morrison Street and Lothian Road,

[1] Developments outside Edinburgh have recently been ruled ultra vires (Anderson, 2000).

Edinburgh, known as the Exchange, in accordance with a development agreement between the company and The City of Edinburgh Council" (EICC, 1997).

EDI and EICC are linked through CEC Holdings which owns both and which was formed as a tax efficient method for dealing with the profits made by EDI (and the losses made by EICC).

EICC Ltd. has operated as landowner on behalf of the City, releasing land for development by commercial developers as and when it sees fit, and as project manager for the development of the whole Exchange scheme. It has not attempted to act in the traditional developer role in the same way as EDI.

## THE CITY OF EDINBURGH'S ECONOMIC AND ESTATES DEVELOPMENT TEAM

The Economic and Estates Development team is part of the City's Development Department. It is a non-profit making team with an interest in developing the City's large land portfolio to the economic benefit of the City. It is now mostly involved in industrial property. Although it has not had an overt input into the development activities of EDI and EICC Ltd, it has indirectly influenced them through its central input at senior officer and Councillor level in the city on economic development issues.

### The present role of the City of Edinburgh Council

Commercial development per se is now mainly through EDI and EICC. The Council continues to steer development both as a landowner (in partnerships where it retains the interest in the land and through the City's Economic Development arm) and as a statutory authority.

## REFERENCES

EDI News Issue 2 1997

EICC Annual Report 1997.

Wall, I. (1998). Private Communication.

Wilson, M. (2000). Private Communication.

**APPENDIX 14**

# Capitalised Leases

The Council was able to take a much more active role direct development of its land portfolio with the realisation that:

i. It was not ultra vires to the Local Government (Scotland) Act, 1973[1] for the City Council to borrow against the value of leases granted by the City on its land holdings (Carsewell, 2000; Anderson, 2000).

ii. The City could treat the income as additional capital income (i.e. additional to the capital expenditure budget set by the Secretary of State).

No permission was required from the Secretary of State to borrow against the value of a lease (Anderson, 2000). However, there were (and still are) limitations:

i. Notional capital leases were only possible, for long leases of 21 years or more.

ii. The monies could only be used for development within the boundaries of the City of Edinburgh Council.

---

[1] Section 94 of the Act relating to Capital Expenditure "It shall not be lawful for a local authority to incur any liability to meet capital expenses except with the consent of the Secretary of State, and the Secretary of State may, if he thinks fit, give his consent for the purposes of this section-

i. Subject to such conditions as may be specified in the consent;

ii. In relation to such project, or to such programme of works, or to such class of works, or to such amount, as may be specified;

iii. In relation to expenses to be mat by the authority within such financial year as may be so specified"

iii. The monies were not to be used to provide the City with capital for other schemes or capital expenditure (Anderson, 2000).

Generally speaking the monies were used for developments associated with the land to which the leases related[2].

[2] In the case of the Edinburgh Conference Centre, however, such capital has been used to offset losses associated with maintenance and other costs (Anderson, 2000; Carsewell, 2000).

## REFERENCES

Carsewell, A. (2000). Private Communication.

Anderson, D. (2000). Private Communication.