Michael Ball, Colin Lizieri
and Bryan D. MacGregor

The Economics of Commercial Property Markets

THE ECONOMICS OF COMMERCIAL PROPERTY MARKETS

Conventional economics has tended to neglect property as a significant sector with its own specific economic characteristics. This volume goes beyond the often descriptive nature of much property market analysis to provide a rigorous study of the economics of property markets that focuses on important theoretical principles. These are concerned with the way in which the built environment in which we live is shaped by forces that drive new commercial building and redevelopment. The book is divided into three main sections, covering

- the microeconomics of property markets
- the macroeconomics of commercial property
- the financial economics of property

Empirical examples drawn from all around the world clearly illustrate the theories and issues discussed. Throughout, the emphasis is on making an often complex area as accessible and readable as possible. This text will be an invaluable resource for students of property economics and related subject areas, as well as to professionals working in the built environment.

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London and New York

First published in 1998
by Routledge
11 New Fetter Lane, London EC4P 4EE

This edition published in the Taylor & Francis e-Library, 2002.

Simultaneously published in the USA and Canada
by Routledge
29 West 35th Street, New York, NY 10001

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
A catalog record for this book has been requested

ISBN 0-415-14992-4 (hbk)
ISBN 0-415-14993-2 (pbk)
ISBN 0-203-01311-5 Master e-book ISBN
ISBN 0-203-20440-9 (Glassbook Format)

DEDICATION

In the course of writing this book, the joys, tragedies and humdrum of life continued. Bryan's wife gave birth to twin daughters, Colin married and moved house and Michael's mother, at the start of the project, and father, towards its end, both died suddenly. These are supposed to be some of the most stressful things that can happen in normal life. Even for obsessive authors, pressed by deadlines, such relationships and events will always be most important. So, we should like to dedicate this book to:

Nicola, Catriona and Eilidh MacGregor
Michelle Lizieri
Muriel and John Ball

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PREFACE

In the mid-1980s, many property market specialists saw little point in studying economics and its applications to commercial property. A good illustration of this is the comment by a senior surveyor that surveying students should not waste time studying macroeconomics and finance but should, instead, learn about the property market. The academic view was no less encouraging. Property economics and finance were seen by many as, at best, a backwater.

Things have changed dramatically since then. It is now an axiom in the property professions that an understanding of the wider context within which commercial property markets operate is essential; and professionals and academics in other disciplines—such as, economics, finance, planning and geography—accept the importance of the study of commercial property markets. There is also a rapidly expanding literature, and growing academic status for the leading property journals.

Commercial markets are characterised by boom-bust periods of over and then under supply, with consequences for the wider economy. The built environment in which we live is shaped by forces that drive new commercial building and redevelopment. These forces are complex and are moderated by institutional contexts. Some are transmitted to property from the macroeconomy and from the capital markets, each of which must increasingly be considered within a global context. Others arise from within the property market itself, in the behavioural responses of the thousands of individuals to the constraints and opportunities existing for them at particular times. Whatever their origin and the feedback effects such forces may generate, there are locally specific outcomes. The roles and functioning of towns and cities are strongly influenced by property market processes. This book sets out to explain those processes and their effects.

When this book was conceived, we thought the task would be easier than it turned out to be. Each of us felt we had a reasonable grasp of the literature, particularly as together we could claim over 50 years' teaching experience of the subject, or parts of it, to undergraduates and post-graduates from all of the relevant academic disciplines. The initial optimism was soon replaced by a sense of the magnitude of the task as we began to piece the book together. Substantial

differences in the level of development of theory in the various sub-areas became far more apparent than any of us had earlier been prepared to recognise.

There has, for example, been much attention over the last ten years to the application of financial economics to the analysis of property investment. While the vocabulary is a mixture of finance and traditional surveying terms, the area is reasonably well developed. In contrast, the influence of commercial property markets on the macroeconomy is poorly understood. No other property text that we know of tries to put property in the context of macroeconomic theory. Yet issues such as the property cycle cannot be properly investigated without incorporating understandings of their relationship to the business cycle.

Surprisingly, the area that we had all expected to be the one of the easiest, the microeconomics of commercial property, proved to be the most difficult to draw together. Despite the extensive literature in urban economics and economic geography, there simply does not exist an adequate and complete general microeconomic theory of urban property markets. There are long running debates about the impacts of the fixed location and long life of buildings, the interrelationships among buildings, and the resultant effects on the behaviour of agents. These, we feel, remain unresolved, even though there are many important insights available from the existing body of theory.

The book is aimed at those with a basic understanding (roughly equivalent to first year undergraduate level) of economics (both micro and macro), statistics and financial mathematics. This is not to suggest that a detailed understanding of these subjects is essential but it helps. The size and scope of the book means that it may not all be relevant to every reader. The unifying theme is the application of standard economic principles to the analysis of commercial property markets.

The book should be of value to students, both undergraduate and post-graduate, in a wide range of subjects, including economics, surveying, planning, geography, construction and finance. We hope it will also be of use to practitioners, especially those involved in research.

ACKNOWLEDGEMENTS

Many people contributed, some knowingly, most unknowingly, to the production of this book. In the course of collaborations, conferences, seminars and informal discussions, we have learned a lot from many people and they have helped us develop our ideas. It is always difficult to single out particular individuals but we have to try in the knowledge that we will miss out someone important. The following probably constitute a sub-set of those who have contributed to the academic content of this book: Andrew Baum, Steven Bourassa, Gerald Brown, Neil Crosby, Maurizio Grilli, Foort Hamelink, Pat Hendershott, Martin Hoesli, George Matysiak, Paul McNamara, Tanya Morrison, Nanda Nanthakumaran, Steve Satchell, David Sunderland, Greg Schwann, Charles Ward and Elaine Worzala.

The support and tolerance of families, friends and work colleagues was much appreciated but probably insufficiently acknowledged. The quiet and professional patience and encouragement of the publishers, particularly Alison Kirk, helped considerably.

We should like to thank these and many more, although we accept full responsibility for any remaining errors and for any confusion or misunderstanding in our presentation of ideas.

Finally, we should acknowledge each other's inputs. We tolerated and were tolerated, and learned much from working with each other.

1

INTRODUCTION

THE IMPORTANCE OF COMMERCIAL PROPERTY MARKET ECONOMICS

This book seeks to provide a rigorous analysis of the economics of commercial property markets. Conventional economics texts neglect property as a sector. By contrast the majority of the existing (UK) texts in the property field are rooted in an urban economics tradition or are little more than introductory economics texts with housing and property examples pasted on. A limited number of other texts concentrate on finance and investment, neglecting wider economic factors. There is, thus, a clear need for a book that examines the economics of commercial property markets in detail, drawing on the growing body of economic research in both space and financial markets, and which provides readers with a clear overview of developments in the field.

An understanding of the economics of commercial property markets is important since there are many property-related issues that affect everyone and shape the built environment. Some of these issues and themes are highlighted below. In the research literature, these issues have been examined from the perspectives of a variety of academic disciplines and professions. These include, economics, finance, geography, sociology, urban economics, law, planning, surveying and construction management. This book integrates those analyses within a formal economics framework.

Before setting out the approach adopted in the book and outlining the content, some of the key economic issues in commercial property are now considered. These are divided into microeconomic, macroeconomic and financial issues, following the three-part structure of the text.

Microeconomic issues in commercial property

In examining micro themes, the text focuses on the structure of demand for commercial property, changing locational needs and the response of land and

property markets to those changing patterns. Relevant contemporary issues include:

- the large areas of vacant industrial properties and of vacant land in the centres of major urban areas in the early 1980s following closure of many manufacturing firms and factories;
- the pressures for the development of out-of-town shopping centres and retail warehouses and grocery superstores in the later 1980s; in some areas this led to major declines in city centre shopping and had environmental impacts;
- the expansion of high technology industrial activities along motorway corridors in the late 1970s and early 1980s; and
- decentralisation of many office-using activities from city centres to suburban, peripheral and satellite locations in the 1970s and 1980s and the development of call centres in the 1990s.

An understanding of market adjustment processes in commercial property markets is critical in analysing these events. Demographic and economic changes create new patterns of demand for property but the response of developers, investors and land owners determines the spatial outcomes and affects the competitiveness and profitability of sectors of industry in a city, a region or a country.

Macroeconomic issues in commercial property

The macro themes investigated in the book include the role of commercial property in the economy, the possibility of 'crowding out' or overinvestment in property, property cycles and the need to model property market behaviour. These are topics of great importance:

- in property booms capital switches from other parts of the economy; in busts, company asset values fall as property prices tumble;
- the property crash of the mid-1970s had a dramatic effect on the UK secondary banking sector with economic—and political—consequences;
- the property crash of the late 1980s led to many company failures and resulted in much high quality but vacant office space, particularly in the City of London; and
- the turmoil in South East Asian financial markets in the late 1990s is linked to the very large amounts of capital tied up in land and buildings and the contribution of property loans to debt in those countries.

The world-wide boom and bust property cycle of the late 1980s and early 1990s raised the awareness of the important links between the macroeconomy and commercial property markets. Generally, in the property literature these

links are only tangentially incorporated into analysis and discussion. There are a number of widely held beliefs concerning property that need detailed examination. For example, the common beliefs that there is overinvestment in property and that the volume of property development is subject to marked cyclical fluctuations are not supported by the available UK data. Economic modelling of property market behaviour is of great importance in analysing the linkage between key economic and financial variables and the behaviour of commercial property.

Financial issues in commercial property

Commercial property has different (and difficult) financial features when compared to other asset classes. Nonetheless, there are increasing trends to integrate property asset management with that of other financial assets. Other key trends include the growth of cross-border investment and the development of indirect investment vehicles. Topics of importance and interest are listed below:

- The types and formats of financial analyses practised by property professionals are very different from those of other asset markets. This causes problems as property must compete with shares and bonds for a place in the investment portfolio.
- A number of well-publicised valuation 'disasters', particularly in the aftermath of the late 1980s and early 1990s property crash, reinforced suspicions about the adequacy of traditional valuation techniques and performance measures based on those techniques.
- Over the last two decades, the major pension funds and insurance companies have decreased the proportion of commercial property held in their investment portfolios.
- In many markets, notably in the United States with Real Estate Investment Trusts (REITs), there has been rapid growth in securitised or unitised property investment vehicles.
- Following financial liberalisation and deregulation in the mid-1980s, there have been large flows of overseas capital into commercial property; a substantial proportion of the office stock in the City of London is now owned by non-UK firms, while UK investors hold large portfolios of mainland European and North American property.

Insights drawn from financial economics help to explain these trends and provide a framework for analysis of investment issues. This is vital in breaking down the isolation of much existing property research.

THE PURPOSE

The purpose of the book, then, is to provide an economic framework within which to explain and understand these and related commercial property issues. The text should prove valuable for property researchers and practitioners in many ways. We hope that it will clarify and deepen understanding of:

- the likely behaviour of economic agents in the property markets;
- the implications for property of new business and social trends;
- the place of property and the development process in the wider economy;
- the causes and significance of property cycles;
- forecasting and modelling property markets;
- financial principles applied to property; and
- the role and consequences of valuation and other asset pricing models.

THE APPROACH

The book is divided into three broad parts covering microeconomics, macroeconomics and financial economics. The first two are standard divisions within economics. Microeconomic analysis investigates individual production and consumption decisions and their influence on the allocation of resources within an economy, while macroeconomic theory deals with interactions in the economy as a whole. The third area, financial economics, examines investment decision-making. This is an important but often neglected perspective from which to understand the economics of commercial property markets.

There has been a vast increase in the amount of research into commercial property over the last decade. Much of this research has drawn on applications from the more developed fields of financial and housing economics. This makes it difficult to write a definitive textbook. Rather, it has been necessary to order and survey the literature, to impose a structure and to set out the main themes of research. While property research related to financial economics has become more developed and complete in recent years, there are major gaps in the literature in other fields. These include the inadequate micro foundations for the modelling of property market supply and demand and the need to establish a formal theoretical link between the macroeconomy and the property market. The book attempts to develop these areas.

The approach adopted is based upon demand and supply interactions in four interlinked submarkets, using a simple competitive model with the assumption of rational economic agents. The remainder of the book is built upon this foundation. This perspective forms a valuable starting point for analysing the relationships and adjustment processes in property markets and has empirical backing. This

does not mean that the model is expected to apply in all situations, rather, it is an 'ideal form' model. Property markets have specific characteristics, including heterogeneity, lumpiness, lack of information and externalities that make simplistic application of the competitive model problematic. The book explores these characteristics and examines modifications and extensions to, and critiques of, the competitive model.

The general principles outlined in the text apply to all commercial property markets. The perspective adopted is largely that of the UK and, to a lesser extent, of the US. European, Far Eastern and Australasian perspectives are used where appropriate. This reflects both the experience and knowledge of the authors and the importance of the UK and the US in the development of these subject areas.

Commercial property is generally divided into broad sectors: offices, shops and industrial property. This division underpins much commercial property research. The categories broadly relate to sectors of employment. Offices serve business and professional services, administrative and government activity; industrial space is utilised by manufacturing industry and warehousing; and shops are the retail outlets for consumption activity. The book does not consider residential property except in passing. Housing economics is the subject of other texts. While residential property is an important real estate investment sector in the US, it has yet to be established as such in the UK. Other classifications of commercial property are possible and new sectors, such as leisure property, are emerging.

In illustrating the economic principles discussed, offices are used more frequently than other sectors. This reflects three main factors. First, much of the published research literature deals with office markets. Second, offices are the most important investment sector by value. Finally, they offer the clearest illustration of many of the issues raised, including location, overbuilding, modelling and forecasting and internationalisation. Since offices remain strongly clustered in the centres of major cities, this leads to a strong urban focus in the text.

The academic development of different areas covered in the book varies. As a result, the form of the material in the book varies too, reflecting the current state of knowledge and the scope of the literature. In some areas, particularly in macroeconomics, a well-developed theoretical framework exists and, hence, discussion focuses on the role of property within existing models. In others, such as urban location, there are a variety of partial explanations drawn from different academic disciplines which must be set into some coherent framework. In areas such as property market forecasting, the field is still developing and material is best presented as a critical review of the research literature with identification of the broad themes. The need to interlink the themes and to cross-reference has led to long chapters. Practical examples and equations have been kept to a minimum to ensure that the focus is on the economic principles.

The book covers such diverse areas that it is unlikely that any one reader could be expected to have the same level of prior knowledge across all topics. However some assumptions have had to be made. It is assumed that readers will have studied micro- and macroeconomics to at least first year undergraduate level; that they will understand the basic principles of probability and statistical inference and that they understand the fundamentals of financial mathematics.

Some clarifications are required as to how certain key terms are used throughout the text. Different parts of the literature use the same terms in distinct ways, which can be confusing. Three that are worth highlighting are the concepts of *efficiency, institutions* and *investment*.

Economic efficiency in much of the economic literature refers to situations where resources are allocated optimally, so that the goods desired in the market place are produced in the cheapest possible way, given current technical knowledge. Consequently, efficiency in this sense is about making the best use of inputs to produce the maximum amount of output. In financial economics, *the efficient market hypothesis* defines price efficiency in terms of the amount of available information that is utilised. Weak form efficiency holds where an investor cannot profit from patterns in historic price series, strong form efficiency holds that prices reflect all available information at a particular time. This results in a more specific definition of price efficiency. This should be borne in mind in reading the financial economics sections.

Institutions in the financial economics literature generally refer to the major investor groups including pension funds, life insurance and general insurance companies. Institutional investors are highly significant in all investment markets including the commercial property markets. They hold a considerable proportion of investment property. In other areas of economics, *institutional analysis* refers to the behaviour of individuals and organisations as market agents and the role of market and social structures, rules and regulations in affecting market processes. This may entail relaxing some of the assumptions of economic rationality in the competitive model. The institutional framework determines how supply and demand adjustment processes take place. Although the particular usage of the term should be clear from the context an upper case I is used to refer to the investing Institutions and a lower case i to refer to institutional analysis and market structure.

In financial economics, *investment* means the acquisition of the title to some asset. Property investment, then, refers to the purchase of land or buildings and the right to receive rent as income and capital value growth. In macroeconomics, investment refers to investment in real goods as inventories or fixed capital. In the macroeconomic sense, property investment refers only to allocation of resources to create new structures—the development process. By contrast, financial investment could involve acquisition of existing property from another investor. Which definition is meant should be clear from the context.

Finally, different parts of the literature use different notations. Where appropriate, these have been standardised. However, to change long-standing notations in economics and property investment would only serve to confuse. Accordingly, in such cases both versions are presented, the notation chosen in a chapter being dependent on the context and the theoretical origins of the research.

THE CONTENTS

Part 1 of the book deals with the microeconomics of commercial property. Chapter 2 sets out *four interconnected property markets:* the *user* market, the *development* market, the *financial asset* market and the *land* market. In the user market, businesses demand space for their economic activities and are prepared to pay a price to occupy that space in the form of rent. The rental level acts as a signal for developers to supply new space and to bid for land held by land owners. The rent is a cash flow for investors in the financial asset market, who acquire property as an investment asset. In the model, equilibrium between supply and demand is established through the *price mechanism*.

Chapter 3 examines the nature of *occupational demand* more closely. Changes in the nature of demand for business space, associated with the growth of services and the decline of manufacturing in developed economies are considered. Next, a framework for understanding *spatial variations in demand* is set out. The chapter concludes with a discussion of the impact of demand on rent and the *response to demand signals* from developers and landowners.

Chapter 4 focuses on the *locational decisions* of firms and the impact of these decisions on the geographical distribution of commercial property. The theories examined will be familiar to those who have studied urban economics or economic geography. It is argued that there is no single satisfactory theory of urban location. Many of the models are deficient in their failure to represent adequately supply-side responses or the role of the financial asset market—a theme developed throughout the book.

Chapter 5 considers the role of *actors and institutions* in the property market in more depth, relaxing the assumptions of perfect competition, economically rational behaviour and the absence of scale effects. The chapter emphasises the importance of individual behaviour and institutional context in the land, development and financial asset markets and hence its importance in the supply of space in the user market. There are a wide variety of approaches to the analysis of individual and *institutional behaviour* in markets including historical approaches, conflict theory, the structure and agency approach and the concept of structures of provision. The chapter considers these various approaches and assesses their strengths and weaknesses in explaining development, land-supply and investment in property markets.

As is evident from this outline, analysis of the development process is interwoven through the microeconomic section. The formal competitive model of the development process is set out in Chapter 2, the developer response to occupier demand signals in Chapter 3 and behavioural and institutional analysis of the supply of buildings considered in Chapter 5. This reflects the authors' views concerning the importance of the interactions between development, user, financial asset and land markets. To treat the development process in isolation is to ignore these critical connections. The role of development in the macroeconomy and cyclical processes in the supply of buildings are examined further in Part 2 of the book, while investment and financial aspects of development are considered in Part 3.

Chapter 6 opens Part 2 of the text by examining *macroeconomic* themes of relevance to the study of property markets. The linkage between property development and theories of *fixed investment* is explored. The chapter discusses the impact of the property development process on the macroeconomy, financial aspects of property booms and the impact of monetary policy on commercial property. The *short-run* perspective adopted in Chapter 6 is complemented by the *long-run* analysis contained in Chapter 7. This chapter, drawing on the themes of *growth theory,* examines the behaviour of property as a long-term investment good and discusses whether there is an efficient long-run allocation of resources and capital to commercial property or whether overinvestment and overbuilding occurs on a systematic or cyclical basis.

Chapter 8 develops the theme of *property cycles*. The property market and the economy as a whole are prone to irregular fluctuations of output and prices. Property markets, in particular, are characterised by boom periods with high levels of investment and rental growth followed by sharp downward adjustments. Explanations for property market cycles may be *exogenous* (in that the stimulus for growth or decline lies outside the property market) or *endogenous* (where the characteristics of property market behaviour generate the cycle). Both are discussed.

Chapter 9 focuses on *econometric modelling and forecasting* of property markets. The main principles of economic models are introduced and the different modelling approaches adopted are critically examined. The chapter highlights the many difficulties encountered in modelling property markets. These include the lack of reliable data, the heterogeneity of commercial property and the complexities of supply-side adjustment processes.

The final part of the book deals with financial economics and financial investment in commercial property. Chapter 10 considers the *investment characteristics* of commercial property, comparing these to those of bonds and shares in a discounted cash flow context. Property is seen to have specific characteristics that make direct comparison across asset classes difficult. One key feature of property markets is the absence of timely transaction price data. As a result, great reliance is placed on estimation of likely selling price—*valuation*. Traditional property valuation techniques are examined critically. The

possibility of variations between valuations and selling prices has important consequences for the price mechanism in the adjustment processes analysed in Parts 1 and 2 of the book.

Chapter 11 considers the place of property in the *investment portfolio*. The chapter looks at the application of portfolio theory to the selection of assets and the allocation of funds for (financial) investment in property markets. This entails further examination of the returns to, and risks of, commercial property as an asset class. The chapter also examines measurement of *investment performance*. The reliance on valuations as the basis for the benchmark indices of property market behaviour makes direct comparison with other asset markets complex and may result in misleading comparisons.

Chapter 12 considers investment in paper assets that are related to commercial property—*indirect investment*. Indirect equity investments include property company shares, property unit trusts and Real Estate Investment Trusts. Indirect debt investments include bonds and loans secured on commercial property. The characteristics of the various investment vehicles are described. A critical question—whether these instruments truly are property investments—is addressed. Finally, Chapter 13 examines *international investment* in commercial property. The chapter explores the growth of overseas investment, the rationale for that investment and the practical difficulties facing investors as they seek to allocate funds to overseas markets.

Although each of the three parts of the book is relatively self-contained, they complement each other and develop common themes. The linkages between the microeconomic, macroeconomic and financial themes reflect the interactions between the user, developer, land and financial asset markets outlined at the start of the book. All three, thus, contribute to a full understanding of the economics of commercial property markets.

Part 1

MICROECONOMICS AND COMMERCIAL PROPERTY

Introduction and commentary

2 A model of commercial property markets

3 User demand and the land market

4 The location of commercial property

5 Property supply and institutional analysis

INTRODUCTION AND COMMENTARY

Part 1 of the text examines the *microeconomics* of commercial property markets. Microeconomic analysis investigates production and consumption decision-making and their influence on the allocation of resources within an economy. The focus of this analysis is markets. Within markets, consumers and producers react to prices which act as signals to bring about a balance between supply and demand—equilibrium. Microeconomics has two broad approaches. The first is that of partial analysis: the examination of one market in isolation. This is accomplished by assuming that everything outside the subject market is held constant. In the second approach, general equilibrium, all markets are examined simultaneously. In the analysis of property markets, the partial approach is most fruitful and is adopted here.

Krugman (1991) has argued that there is no complete microeconomic model of urban land and property markets. The specific characteristics of commercial property, detailed in the four chapters in this part, allied to complex interactions across space and time make analysis highly complex. It is thus important that a micro-level analysis examines the nature of property markets and the role of individuals and firms—the actors—in these markets. Additionally, given that land and buildings are fixed spatially (unlike most commodities), it is important that a spatial component is introduced to the analysis.

Microeconomics uses models which are a simplified representation of reality. They can be tested empirically, using real world data. These models make a number of simplifying assumptions from which it is possible to deduce how individuals and firms are expected to behave. These may include the idea that all individuals behave in an economically rational manner, that information is widely and costlessly available and that prices adjust quickly (frictionlessly) to changes in supply and demand. The models then form a valuable framework for organising thinking about problems and for asking 'what if' questions about the changing economic environment or about the policy decisions of government or businesses. However, markets are complex and many of the simplifying assumptions may not apply. This is particularly true of urban land and property markets.

In commercial property markets, the demand for consumption might come from a firm deciding whether or not to lease new space for its business operations; a production decision might be a developer deciding whether or not to build a property for sale. Price, in the former case, is the rent payable under the lease contract; in the latter, it is the sale price achieved or anticipated for the completed scheme. The rent and the sale price are linked through activity in the investment market—a theme developed more fully in Part 3.

Chapter 2 introduces a model of commercial property markets. The model examines the role of rent as the price mechanism that balances supply and demand, achieving equilibrium in four interlinked markets: the *user market,* the *development market,* the *financial asset market,* and the *land market*. Rent may be viewed in different ways. On the one hand, rent may be considered as the amount a business is able and willing to pay to occupy a particular site and building. The property enables the firm to carry out profitable trading. Rent is an input cost which affects profitability. On the other hand, the owner of the property anticipates a return on capital invested that is competitive when compared to other possible investment assets and allowing for the risks of ownership. These two views of rent produce, respectively, the demand and supply curves for the property.

In the *user* market, firms seek to occupy a stock of buildings. The amount of space required will depend on output levels, profitability and asking rents. As output expands, firms seek more space and hence demand increases, raising rents in the absence of an increase in supply. However, if rents are high, firms may seek to occupy space more intensively—for example by reducing the floor space per worker—or may substitute another factor of production for land and buildings. Space available to occupiers depends on the existing stock and any new stock completed. Although it is subject to obsolescence and depreciation and must be replaced over time, the stock of buildings has a long economic life. New stock is generally small as a proportion of the existing stock and takes time to produce. As a result the short-run supply curve will tend to be *inelastic*.

Property is also an investment. In the *financial asset market,* owners seek a return on their capital comparable to the returns available in other asset markets allowing for differences in risk. The relationship between this return and the rent determines the price or capital value of the property. This capital value acts as a signal for construction firms and property companies in the *development market*. When capital values (prices) are higher than the cost of provision, new stock will be constructed, altering the supply available in the user and financial asset markets. Since it takes time to construct new property, decisions are made on the basis of expected prices. If new development is to take place, sites must be released in the *land market*. Competing land uses and sectors compete for land and space and so determine the price.

Changes in any one of these four markets lead to changes in the others. An increase in demand in the user market raises rents. Other things being equal,

this increases the price of property in the investment market. Higher prices may encourage developers to increase the supply of buildings and persuade landowners to release land for that development. The resultant increase in the stock of buildings leads to downward pressure on rents in the user market, thus restoring equilibrium.

The interrelated markets have to adjust continuously to new demand and supply conditions and must accommodate shocks. The chapter, thus, considers the adjustment processes in those markets. Features of the property markets, including fixed locations, durability, high costs both to supply and demolish buildings and institutional constraints, result in adjustment processes that are slower than in most other markets. It may take three to four years for developers to complete a city centre office building. Failure to anticipate employment growth may, therefore, result in rising rents as occupiers compete for space in the existing stock. The possibility that such lags in adjustment processes contribute to property cycles is considered further in Part 2.

Chapter 3 examines user demand and its relationship with the land market. The demand for commercial space varies by sector of the economy and by geographical location. Sectoral activity levels provide an indicator of property demand. Thus, growth of business services employment is linked to increased demand for office space, increased consumer spending leads to greater demand for retail space and increases in manufacturing output are associated with demand for industrial space. However, the relationship between output and demand for space changes over time as production technologies change and as firms vary the proportions of capital, labour and land. Within an economy, the mix of service and industrial activity alters over time and is reflected in levels of demand for particular types of property.

Within urban markets, there are spatial variations in demand. In Chapter 3, broad explanations of these patterns are examined. The *export base* model suggests that demand in a city or region is induced by exports. The assumptions of this approach are subject to criticism. *Transport cost* models suggest that the attractiveness of urban locations, and hence spatial variation in demand for space, depends upon accessibility. Many of the traditional transport models assume that the city centre is the point of maximum accessibility. With technological change, urban diseconomies and decentralisation of population and firms, this assumption is questionable. Finally, *agglomeration economies*—the advantages of firms clustering together—are considered. Agglomeration economies may relate to a sector, for example, manufacturing firms in an industrial district benefiting from shared information and economies of scale in obtaining factor inputs. Alternatively, they may occur due to the scale and diversity of large cities.

The supply-side response to changing levels of demand depends on reaction in the land market. Demand is constrained by inelasticities in supply. This is addressed in the final section of Chapter 3. The responsiveness of landowners

(and developers) to price signals is critical to market adjustment processes. The existence of externalities and the wider impacts of urban development have been used as justifications for intervention in the property market, for example through planning controls or differential taxation. The potential implications of such actions are considered.

Chapter 4 examines spatial variations in demand in more detail, focusing on the locational decisions of firms. It develops the themes of accessibility and agglomeration economies introduced in Chapter 3. Within the framework of the model developed in Chapter 2, rent should function as an allocation mechanism to ensure that each site is in its 'highest and best' use, the land-use that is most profitable at that location. Firms in the most profitable sectors are able to outbid firms in other sectors for use of a site. The rent bid is associated with the site and building attributes and with accessibility to other factors of production. Since these advantages will vary by type of activity, spatial separation of function should occur. Thus, location theory should help to explain the geographical patterns of land-use.

The chapter examines the classical models of location theory by sector. The traditional models of location, those of Alonso, Christaller, Lösch, Weber and others. These models, based on the transport costs of inputs, including labour, and the finished good, were developed when the central areas of cities were the most advantageous in terms of accessibility. The rise of private car ownership, decentralisation of population, congestion and environmental problems in cities, technological change and new working practices and consumption patterns have changed the balance of advantage. For many types of activity, an out-of-town location may be favoured. The locational decision is also influenced by, and influences, the price of land and buildings in different locations.

The model set out in Chapter 2 and developed in Chapters 3 and 4 is an abstract model that contains simplifying assumptions about individual behaviour. In translating the model to reality, it is necessary to relax many of those assumptions. Chapter 5 considers the role of actors and institutions in the property market in more depth, relaxing the assumptions of perfect competition, economically rational behaviour and the absence of scale effects. The chapter emphasises the importance of individual behaviour in the land, development and investment markets and hence its importance in the supply of space in the user market.

There is a wide variety of approaches to the analysis of individual and *institutional* behaviour in markets. Neo-classical economic approaches maintain many of the assumptions of the equilibrium models and explain actual behaviour in terms of *rational expectations, transaction costs* and *asymmetric information*. *Historical approaches* emphasise the role of individuals and the contingent nature of decisions. *Conflict theory* attempts to identify groups with interests in the development of a particular site and explains the development process as the outcome of a struggle between those interests. Finally, there are wider-scale social explanations of urban processes, the *structure and agency* approach and the concept

of *structures of provision,* which seek to provide a framework for the analysis of local, regional and national outcomes. Chapter 5 considers these various institutional approaches and assesses their strengths and weaknesses in explaining development, land-supply and investment in property markets.

The market adjustment models outlined in Part 1 of the book provide an analytic context for subsequent sections. Part 2 outlines the macroeconomics of property markets and the interaction between property markets and macroeconomic variables. The impacts of macroeconomic changes are translated into local property outcomes through the mechanisms described in Part 1. Part 3 considers property as a financial asset—how the property investment market functions. The impact of investment decisions on prices affects land release and the development decision and, through these, the supply of space to the user market. The interlinkage of the user, development, investment and land markets thus forms a critical backdrop to the rest of the book.

2

A MODEL OF COMMERCIAL PROPERTY MARKETS

INTRODUCTION

This chapter considers supply and demand in property markets. First, a short-run model of supply and demand is presented diagrammatically in the four interlinked markets already described in Chapter 1 —the user, financial asset, developer and land markets. Then the long run is examined. Following this, the short-run model is developed to include expectations. This enables consideration of two theories of market adjustment: namely, the cobweb and building lag approaches. A final section summarises and draws some conclusions.

The purpose in presenting this model is that it forms the theoretical underpinning what follows in the subsequent chapters of this book. It presents the micro-foundations of economic behaviour in property markets. There are many different aspects of property market economics that are covered throughout this text, and the distinct languages of the social sciences, finance and the property world are used at various points to examine these issues. On occasions the form of the reasoning may seem a long way from this simple model, but little of the analysis contradicts its principles. The model makes strong simplifying assumptions but the greater complexity of later chapters should be regarded as additions to this approach, rather than alternatives to it.

There are many analyses of what can broadly be termed the 'economics' of property markets that do not adopt this form of analysis, relying instead on geographical, institutional, sociological or radical theories. There are some contexts in which these alternative views are clearly right. Behavioural supply and demand models cannot answer all the questions of relevance, including examination of the organisational structure of property markets and conflicts over land-use. Mainstream economics, nonetheless, still has many useful things to say on these matters, as later chapters will show. Moreover, the alternative perspectives would benefit from an understanding of how the property market 'works'. This requires investigation of the constrained behaviour of agencies demanding and supplying commercial accommodation.

RENT AND MARKET CLEARING

Supply and demand models examine the interaction of the factors determining the supply of a good or service, and those influencing the demand for it. The general outcomes are equilibrium prices and quantities, although it is the causal processes by which that equilibrium is reached that are of greatest interest. When setting up a model of commercial property markets, it is initially necessary to define the meaning of prices and quantities.

In the user market, the payments a firm makes in order to use a given amount of commercial property for a particular time period is called building rent here. So building rent is the full cost to users of hiring commercial space. Owner-occupied commercial property has costs of use that implicitly constitute rent—often known as 'imputed rent'. Building rent plays the role that price usually does. It acts as the key signal to agents active in the market, and, through its rises and falls, clears these markets by equating the quantity supplied with that demanded. (Some rent models do not assume market clearing, and these will be elaborated at various subsequent points in this book.)

In the financial asset market, the price of a commercial building is the current estimate of its value. Virtually all commercial properties are bought and sold on the basis of a professional valuer's estimate of their current worth, rather than simply on the basis of a direct trade between buyer and seller. Criticisms can be made of those valuations, as Chapter 10 notes, but for the purposes of the model, commercial property prices are assumed to reflect true market prices. Land costs are treated as a simple, quality/location adjusted, land price per hectare.

Quantity requires some simple, standard measure: assuming away, for ease of exposition, the complexity of real supply where commercial buildings come in many different forms, qualities and locations. A standard unit of offices is used as the quantity measurement. One way to consider this is that office buildings provide an annual service by providing a quantity of office space, so a unit of office services would be the time specific measure.

The level of analysis for which the model is relevant is variable. Its usefulness depends on the type of questions being asked, and the applicability of its assumptions to that issue. The model could refer to the national commercial property market as a whole or to a more spatially disaggregated level, such as a city or region; alternatively, it could focus on functional divisions in terms of the type of building use, the most obvious being a separation into office, industrial and retailing uses. The most important limiting factor on the applicability of the model is that it assumes competitive markets. It could be argued that the more localised the analysis, in either spatial or building use terms, the less likely is it that the competitive principle holds in practice. This is because a world of many consumers, developers and producers of commercial buildings should be sufficient to ensure the existence of competition, but this is less likely to exist the smaller is the market in question.

To adopt such a stance, however, would be to deny the existence of competition at any level of analysis, because aggregation across monopolistic markets does not of itself make those markets competitive. What is required instead are behavioural processes generating the conditions for competition at all market levels. Few active players in a market, and bilateral negotiation rather than autonomous market signals, may be necessary conditions for monopolistic practices—but they are not sufficient.

Competitive principles will still hold if users can relatively easily substitute one location for another. In 'small town' cases, for example, most of the time, users would be able to relocate to another town if property owners tried to exercise their monopolistic powers too strongly. An assumption of competition would also still be valid, if new suppliers can easily enter the commercial markets of particular localities when returns in them rise above the norm. Local markets may, in other words, be contestable, even when competition seems limited.

As with standard price theory, it is important to note the principal causal role of rents and prices—quantities adjust to changes in prices. It is conceptually possible to envisage the direction of the causality the other way round from quantities to prices, or for the simultaneous determination of both. However, the point is that, in competitive markets, it is price that provides the key market information to the thousands, or even millions of, unrelated market players. Each agency then adjusts the quantities it wishes to buy or sell in relation to price, given its objective function—say, profit or utility maximisation. Quantities could not play this central role because it is impossible for everyone in an uncoordinated market to have a good knowledge of available quantities of supply and demand at any particular price level.

The following section explores simple, interrelated supply and demand models of user, financial asset, developer and land markets to reach an understanding of the market clearing roles of building rents, property and land prices and construction costs. Offices are used to illustrate the model.

Property markets as interlinked markets

Supply and demand analysis for property markets is rather more complicated than that given in standard introductory microeconomics texts, because the property market is best conceived as made up of several interlinked markets.

- In the *user market,* there exists a *stock* of offices, which house the activities of office users or are temporarily vacant. This stock may be owned directly by the users themselves, as owner occupiers, or rented from a property company or financial institution. The existing stock of offices is subject to wear-and-tear depreciation, requires regular maintenance, and becomes technologically obsolescent.

- A stock of offices is also a set of *financial assets* to those owning it. If owners are economically rational, they would compare the risks and rewards of property ownership with those of holding other financial assets. The behaviour of the markets where property is a financial asset consequently is driven by the opportunity cost of the capital invested in offices. (Part 3 of this book deals with property as a financial asset, including the risk pricing of property investments.)
- In locations where the demand for office accommodation is increasing, the stock of offices will need to be expanded or the floor space per worker allowed to fall. So development greater than that required to replace obsolete buildings in the locality will be required. Office building takes place in the *development market*. In this market, developers—in conjunction with construction companies—generate new office buildings to be owned by investors.
- Finally, both the user and the development markets are connected to the *urban land market*. Given the limited availability of land at any location, competition over land use generally exists. Existing offices have to compete with new office developments and other land uses for a plot of land. Opportunity cost is an important factor in determining land rent at any particular location.

Market clearing in the four property submarkets

For there to be full equilibrium in the overall property market, all four submarkets must simultaneously be in equilibrium. That this is not always rapidly achieved is hardly surprising, and raises interesting questions of dynamic adjustment. When property markets are out of equilibrium how do they get back to equilibrium? Demand and supply analysis is generally comparative static in method—that is beginning and end points are considered. With property markets, however, it is often the dynamics that are of most interest. The tools and information that exist are not, unfortunately, always adequate. Nevertheless, some interesting dynamic issues can still be explored. Some will be examined later in the chapter, when a simple interlinked market supply and demand model is developed. Others are taken up in later chapters, particularly those in Part 2 which covers macroeconomic issues.

Another feature of the four interlinked markets is that three of them are associated with stock relationships—the stock of office accommodation, the stock of property assets, and the stock of land; while the other market is concerned with product flows—the supply of new office buildings. This interlinked stock/flow set of relationships is one reason why it is conceptually better to consider the property market as the product of a set of interlinked markets.

Equilibrium modelling is an ideal construct, illustrating the adjustment pressures in a market rather than describing their normal states. This is because,

in reality, markets are continuously having to adjust to new conditions of demand and supply, including unforeseen shocks and, thus, are unlikely to be in full equilibrium at any point in time. Processes of disequilibrium adjustment are likely to feature highly in property markets. In other markets, such as some financial ones, adjustment is very rapid. In many consumer goods markets, adjustment can also be fast. Excess stock, for example, can be disposed of through cut price sales in a matter of weeks. Offices, however, are fixed in location, expensive to demolish and long-lasting. Institutional arrangements and conventions such as long leases induce further lags. Adjustment processes in property markets are, therefore, inevitably slower than in many other markets. Rents also tend to be sticky—for a variety of reasons that are elaborated at various points in the rest of the book.[1] Rents consequently do not tend to fall rapidly to short-run market clearing levels, whenever there is a temporary glut. This mixture of quantity and price stickiness in commercial property markets makes adjustment in them far longer than in many other markets.

A SIMPLE MODEL OF PROPERTY MARKET CLEARING

The four submarkets that need to be simultaneously in equilibrium for the overall property market to clear were identified in the previous section as the user, financial asset, development and land markets. This section presents a relatively simple set of demand and supply relationships to indicate how these markets function and interrelate.[2]

The model is presented diagrammatically in Figures 2.1 to 2.4. Its main assumptions are laid out as the model is explained. The first, and crucial, assumption is that property markets are broadly competitive, so that a competitive market analysis can be applied to them.

The second important assumption is the time span covered by the analysis. The figures refer to the short run. The short run is defined in economics as the period when at least one factor of production is fixed. This analysis assumes that the available stock of offices is fixed in the particular time period in question, t. New office building undertaken during that period can then be added to the existing stock to create the available stock for the next period, t+1. Long-run equilibrium will be considered later.

The user market

Figure 2.1 considers supply and demand in the user market. The solid lines give the initial equilibrium position. There is a fixed stock of offices, Q, at time, t. This stock is assumed to be well-maintained, and there is no technical obsolescence, so that depreciation can be ignored. As the stock is fixed, supply is perfectly inelastic. It will exist, in that quantity, whatever price is paid for it.

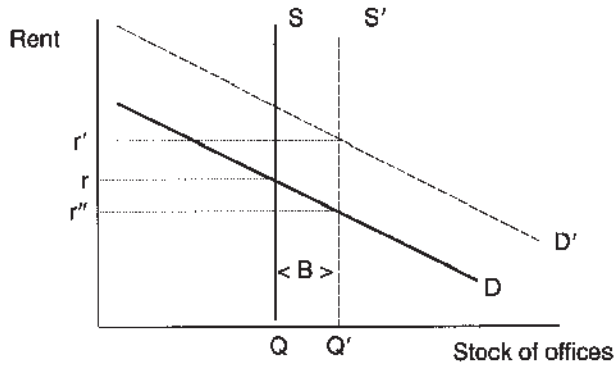

Figure 2.1 Supply and demand in the user market

Over time, of course, some parts of the stock will be withdrawn and some added through new building. This will shift the vertical supply curve to the left or right respectively. The dotted supply line in Figure 2.1, for example, is a hypothetical example of the stock, Q´, in year t+1, when the stock has been increased by an amount, B.

The scale and the longevity of the stock of commercial buildings means that new supply is only a small proportion of total supply. For example, the total stock of offices in England and Wales increased by only 28 per cent between 1984 and 1994, despite the period being one of record new office building. If the growth rate had been even over that ten year period, this means that new supply would have expanded by 2.5 per cent a year. Of course, the period was marked by an extreme boom, but, even in the boom years, net stock additions were still a small proportion of the overall existing stock.

The demand for offices is shown as downward sloping in Figure 2.1. This reflects standard demand analysis, whereby a lower price stimulates extra demand. A simple demand model for offices would suggest that the quantity demanded is a function of rent, r, a firm's output, O, and the amount of office space it uses per worker, WS, in any period t, that is:

$$D_t=f(r_t, O_t, WS_t) \qquad (2.1)$$

The time subscripts will be ignored from now on for simplicity. Notice that the function refers to a 'firm'. Again, for modelling simplicity, it is easiest to assume a demand function for offices with its augments based on typical firm behaviour. This makes it possible to aggregate across firms, allowing demand and supply analysis to move easily between the individual and the aggregate levels.

Demand curves represent the pure response of the demand for office space to changes in rents. They assume all other arguments in the demand function

remain the same. (In the case shown in equation 2.1, firms' outputs and office space per worker ratios are held constant). Why does demand change when rents alter? The key lies in the ways in which firms chose to produce. When firms see a fall in rents, while the price of all other inputs remains the same, they will be encouraged to substitute away from other factors of production towards offices, *for a given level of output,* insofar as the technical conditions of production allow them to substitute. The lower the rent, the greater the likely substitution into extra accommodation and vice versa. (Formally, the demand curve for offices represents the marginal revenue product of office use as a factor of production for creating a good or service. This can be derived by setting up a production function, for a known range of technologies, input prices and final product price, and solving the constrained maximisation problem (see, for example, Gravelle and Rees, 1992).

In practice, short-run office demand curves are unlikely to be very sensitive to rent levels and, therefore, tend to be inelastic. This is one reason why rents are sticky in a downwards direction. As they face relatively inelastic demand schedules in the short run, landlords would have to reduce rents considerably in order to have much effect on the quantity of office accommodation demanded. The longer the time period, however, the easier it is for firms to change their production methods and the location of their activity; so, in the long run, office demand is likely to be the more elastic. The demand curve over the long run consequently is likely to be flatter than that shown in Figure 2.1.

So far movements along the office demand curve have been considered. Which conditions lead it to shift, either to the left or the right? The answer is whenever any of the other non-rent arguments in the demand function change. In equation 2.1, the other influences on firms' demand for office space, apart from rent, are their outputs and office space per worker ratios. When output changes, the demand curve will shift—to the right if output rises, and to the left if it falls; similar adjustments will occur with increases and decreases in office space per worker. The curve will also shift when any other factors in more complex demand functions change.

The dotted demand curve, D´, represents an upwards shift caused by an increase in firms' turnovers. The rise in business, for example, may mean that more staff need to be recruited and that they all require desk space. More office accommodation is, therefore, required by firms to achieve their new higher outputs. With fixed supply, rent rises. If demand for office-using firms' outputs falls, conversely, lay-offs of staff will take place, and the office demand curve shifts to the left and rents fall.

The demand function for office accommodation is based on firms' production decisions. Offices confer no ultimate utility to their users, only the conditions for the production of particular goods and services. Office demand is consequently a *derived* demand; it is derived from the demand for

the goods and services produced using office accommodation. This argument even holds for the marble laden hallways or glamorous atriums often seen in prestige office developments. Such characteristics either help firms conduct their business, for example, by signalling probity or success to clients, or confer some implicit payment to managers and staff. Baum and Crosby (1995) refer to this latter aspect as 'psychic income'.

Putting the supply and demand functions together enables market equilibrium to be determined. The initial equilibrium position in Figure 2.1 is a rent r and a stock of offices Q. Here the market is cleared, with demand matched by the available supply, because at the rent r just as much office space is demanded as is supplied. At equilibrium, the office vacancy rate is either zero, or, more realistically because of market frictions, some finite number often called the 'natural rate of vacancy' (see Chapter 9). For simplicity, it is assumed that the vacancy rate is zero.

Property as a financial asset

The equilibrium rent, r, is one of the variables determining the value of a building. The annual net rental flow has to be multiplied by the inverse of a capitalisation factor, 1/k, to determine its value or market price, P. This is shown in Figure 2.2. The capitalisation factor, k, is determined in the two main ways described below.

- By *valuation rules*. The various approaches are surveyed in Chapter 10. Whether professional valuation is equivalent to an implicit economic evaluation is one of the criteria for judging the 'efficiency' of the property market, as that chapter discusses.
- By *economic evaluation*. Here the annual rental flow is capitalised into a net present value, taking into account depreciation and rental growth. The appropriate discount rate is the long-term bond rate, with any necessary additional premiums for risk and subtractions for expected rises in property rents/capital gains (see Chapters 6 and 10).

Here, again for simplicity, it will be assumed that valuations accurately reflect prevailing market prices, so that the two are synonymous.

There is an inverse relationship between the value of a building with a known future rental stream and the rate of interest. When interest rates rise, the present value of a flow of rents falls; conversely, when interest rates fall the present value rises. This relationship is shown in Figure 2.2. Each ray from the origin shows the value of a rental stream at a given capitalisation factor k. Higher interest rates shift the ray to the left, k^*, and lower ones to the right, k^+; leading to new values P^* and P^+ respectively.

For the purposes of this analysis, therefore, a simple formula is sufficient to identify the determinants of the price of an office building:

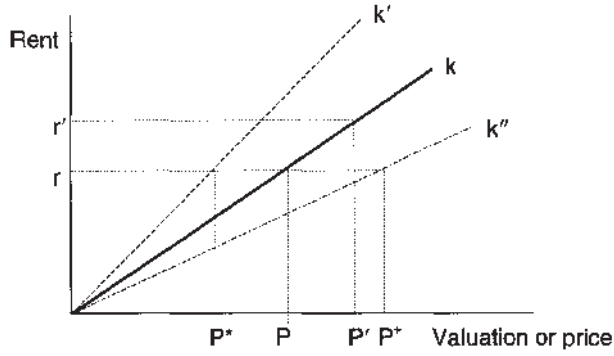

Figure 2.2 Property as a financial asset

(2.2)

where P_t is the price of a standardised office unit at time t; I_t, the prevailing net income derived from letting the property; and k_t the capitalisation factor.

Is a competitive capital market a realistic assumption?

The implicit economic model illustrated in Figure 2.2 argues that there is a perfectly elastic flow of capital into the holding of commercial property as a financial asset. This is based on the principle that investors are indifferent between the characteristics of financial assets, once the distinctive features of each have been priced into its market value, and that financial markets are competitive. It may be argued that these are unrealistic assumptions, because specific types of financial institution, such as pension funds and insurance companies (frequently called the Institutions), invest in property and, therefore, in some way 'control' the market. This, for example, has been suggested by Minns (1980) and Ingham (1984). Quite what control means, however, is unclear. The competitive principle, when used as an ideal construct, allows some clarification of what the implications may be.

1 The control proposition argues that there is an incompatibility between the existence of a specific set of large investing Institutions and a competitive market. This is not necessarily true. Some institutional forms may have lower (transaction) costs when dealing in property, and hence are more economically efficient than others (see Chapter 5). If specific institutional forms do generate economies within property markets, empirical observation that they are important actors in property investment, consequently, may be a sign of competition working rather than its negation.

2 A reason for the existence of particular types of institution may be that particular tax breaks are given for specific institutional structures (non-profit pension funds, for example) and for some investment vehicles. Governments for whatever policy reason are, in effect, subsidising particular financial institutions through these actions—allowing them to prosper over others. Whether this distorts the financial market for property assets depends on the conditions under which those benefits are conferred. The tax breaks are also likely to alter the relative post-tax prices of property assets, rather than be expressed in institutional market power. So, again, control may mean little that is different from competitive market practices.

3 Financial regulation may have restrictive effects on competition by allowing only certain types of financial institution to be active in a market. Traditionally, many countries' financial systems have been segmented, and foreign competition limited. If such traditional restrictions constrain the flow of capital into property investment, then those that are allowed to invest can command a higher return from their property investments than would be determined competitively. The market prices of buildings will be lower than in a free market, because, implicitly, property investors have raised the capitalisation rate above that in a free market. Lower prices will discourage new developments, and hence restrict office supply and raise rents. The effect of monopoly in property markets, therefore, is similar to that in other markets—prices are higher for users and quantities supplied lowered. If such constraints are imposed on property markets through financial regulation, the efficiency loss may be high.

Financial regulation may however have the opposite effect in the property market, and cheapen funds, because regulation does not allow them to flow to their most remunerative activity. Traditional financial controls often included a requirement that specific types of institution can only enjoy tax and other regulatory privileges if they invested in specific assets. Pension funds and insurance companies in the UK, for example, had great difficulty in investing overseas prior to 1979, because of exchange rate controls. This would have encouraged them to invest in UK property, depressing returns from it, raising property valuations above their free market levels, and encouraging a greater than efficient supply of commercial property. In practice, most modern property markets have access to a wide range of sources of capital, apart from financial institutions, including capital from overseas, bank lending and share and bond issues. So, the impact of financial regulation in many countries is a characteristic of the past rather than the present day.

4 Another situation when property market 'control' by financial institutions might have real effects is when they explicitly or implicitly collude. It is