

PROPERTY  
VALUATION

SECOND EDITION

PETER WYATT



 WILEY-BLACKWELL



# Property Valuation



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# Property Valuation

Second Edition

**Peter Wyatt**

School of Real Estate & Planning  
Henley Business School, University of Reading

 **WILEY-BLACKWELL**

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*To Jemma, Sam and Tom*



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# Preface

Welcome to the second edition of this book. I was told that writing a second edition is easy, just update the timelines on the graphs and sprinkle a few up-to-date references around and that should do it. Not so. I suspect that I am not alone in having seen the first edition in print for the first time, immediately beginning to think of ways to improve the structure and content. So that was the starting point for the second edition – to incorporate the changes that inevitably result from releasing the book for property valuation students over the past five years (is it really that long since the first edition?).

The difficulties described in the preface to the first edition remain; setting applied real estate economics in an academic context but, as the years pass and the body of real estate literature broadens and deepens, the task becomes more achievable. The book attempts to combine the academic and practical roots of valuation. This edition of the book retains its focus on property valuation and appraisal at the asset level and delves only superficially into the disciplines of law and management and I have not ventured into the world of investment portfolio analysis. The interdisciplinary nature of real estate practice means that terminology can be a problem and so all the key terms emboldened in the text are defined in a glossary at the back of the book.

The structure of the text has been substantially revised in this second edition. Part A introduces the key microeconomic principles, focusing on land as a resource, production functions, supply and demand and price determination. The locational aspect of real estate is also introduced. Macroeconomic considerations are categorised by the main market sectors (and their function); the market for land (development), for space (occupation) and for money (investment). Having set the economic context, Chapter 3 explains why property valuations are required and discusses the main determinants of value and how they might be identified. Chapter 4 introduces the mathematics required to financially quantify value determinants. Part B of the book describes the methods of valuation and Part C applies these methods to the valuation across a range of property types for a wide variety of purposes.

The companion website to this book ([www.wiley.com/go/wyattpropertyvaluation](http://www.wiley.com/go/wyattpropertyvaluation)) contains PowerPoint slides for lecturers, self-test questions and answers for students.

The primary dictionary definition of the term *property* is used in this book, namely the ownership of landed or real estate. The term property is, however, used interchangeably to describe the physical entity itself and the ownership of a legal interest in a piece of landed or real estate. The word property is also used to describe property in a singular and plural sense. As before, calculations in the book were performed using a spreadsheet but appear in the text as rounded figures.

# Acknowledgements

My sincere thanks go to Danny Myers at UWE for his contribution to Chapter 1, to Pat McAllister for his help with the questions and answers available at the book's companion website, and to Wiley-Blackwell. I would also like to thank my wife, Jemma, and two sons, Sam and Tom. Just because I sat at a computer, it doesn't necessarily mean I'm playing games or searching for 'another' new bike!

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# Part A

# Property Value and Property Valuation

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The legal ownership of land and buildings, collectively referred to as **property** throughout this book, confers legal rights on the owner that enable it to be developed, occupied or leased. The physical occupation of property is essential for social and economic activities including shelter, manufacture, commerce, recreation and movement. Typically, physical property ownership is not desired in its own right, although prestigious or landmark buildings can confer non-financial value. Rather, demand for property is a derived demand; occupiers require property as a factor of production to help deliver the social and economic activities and investors require property as an investment asset. This concept of derived demand has a direct bearing on its valuation.

This book is all about valuing *individual* properties or premises (units of occupation) within properties that are used for business purposes – what will often be referred to as commercial or business property. The interaction between the supply of and demand for property generates exchange prices and valuations are estimates of those prices. Value is thus an economic concept and valuers are primarily concerned with how market participants measure value.

In this first section of the book Chapter 1 outlines the microeconomic concepts that are relevant to property markets and estimates of exchange price. It will introduce microeconomic terms and concepts associated with the supply of and demand for land and buildings, the concept of rent as a payment for their use and

some land use theory. It explains how property values arise using economic principles and theories that have been developed and expounded over the past century and a half. Building on the theories relating to the agricultural land market, the causes and spatial distribution of urban land and property uses and rents are described. The chapter explains the causes of price differentials between land uses and over space. In doing so it homogenises the product to a large extent, only really differentiating between the main commercial land uses of retail, office and industrial space. Chapter 2 describes the macroeconomic influences that cause the property market to be dynamic, since it is subject to constantly changing market conditions and cyclical macroeconomic pressures. As a result the value of property varies over time and space at its various scales. The chapter ends with a look at macroeconomic property market cycles. Whereas Chapter 1 is an attempt to explain property value by examining the economics of supply and demand and the establishment of equilibrium exchange price in the property market and its constituent sectors, Chapter 3 focuses on valuation, being the estimation of exchange price and describes the determinants of value. The mathematics and procedures that underpin the valuation methods described in subsequent chapters are introduced in Chapter 4.

# Chapter 1

## Microeconomic Concepts

Economics is conventionally divided into two types of analysis: microeconomics and macroeconomics: **microeconomics** studies how individuals and firms allocate scarce resources whereas **macroeconomics** analyses economy-wide phenomena resulting from decision-making in *all* markets. One way to understand the distinction between these two approaches is to consider some generalised examples. Microeconomics is concerned with determining how prices and rents emerge and change and how firms respond. It involves an examination of the effects of new taxes and government incentives, the characteristics of demand, determination of a firm's profit and so on. In other words it tries to understand the economic motives of market participants such as landowners, developers, occupiers and investors. This diverse set of participants is rather fragmented and at times adversarial but microeconomic analysis works on the basis that we can generalise about the behaviour of these parties. A particular branch of economics known as *urban land economics* is concerned with the microeconomic implications of scarcity and the allocation of urban property rights. This section brings together and explains the key microeconomic concepts and theories that have a bearing on urban property markets and the important work of authors like Alan Evans, Will Fraser, Jack Harvey and Danny Myers in relating classical economic concepts and theories to urban land and property markets is acknowledged.

### 1.1 Supply and demand, markets and equilibrium price determination

This book does not seek to present all facets of microeconomics; the focus is on price determination. The world's resources – land, labour and capital – are used to create economic goods to satisfy human desires and needs and **economics** is

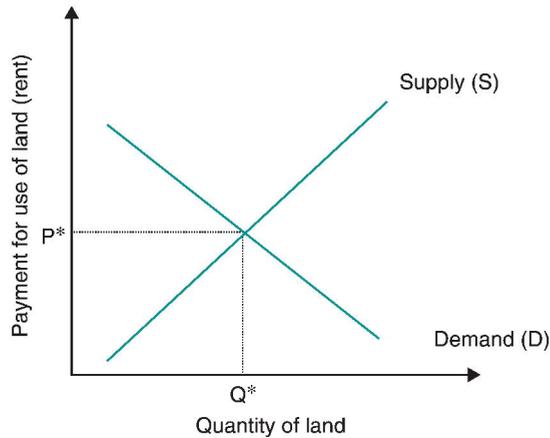
concerned with the allocation of these finite resources to humanity's infinite wants. This problem is formally referred to as **scarcity**. In an attempt to reconcile this problem, economists argue that people must make careful choices about what is made, how it is made and for whom; or in terms of property, choices about what land should be developed, how it should be used and whether it should be available for purchase or rent. In short, economics is the 'science of choice'. Because resources are scarce their use involves an **opportunity cost** – resources allocated to one use cannot be used simultaneously elsewhere so the opportunity cost of using resources in a particular way is the value of alternative uses forgone. In other words, in a world of scarcity, for every want that is satisfied, some other want remains unsatisfied. Choosing one thing inevitably requires giving up something else; an opportunity has been forgone. This fundamental economic concept helps explain how economic decisions are made; for example, how property developers might decide which projects to proceed with and how investors might select the range of assets to include in their portfolios. To avoid understanding opportunity cost in a purely mechanistic way – where one good is simply chosen instead of another, we need to clarify how decisions between competing alternatives are made. Goods and services are rarely bought to yield a one-dimensional type of utility to the purchaser; the purchase usually fulfils a range of needs. As Lancaster (1966) explained

The good, *per se*, does not give utility to the consumer; it possesses characteristics, and these characteristics give rise to utility. In general... many characteristics will be shared by more than one good.

For example, a commercial building provides a range of services for the tenant; office space for employees, a certain image, a specific location relative to transport and supplies, an investment and so on.

An assumption must be made at this early stage; that consumers of resources seek to maximise their welfare. Our concern is with commercial property and therefore businesses are the resource consumers and welfare to them means profit. Businesses seek to maximise their profit. A budget constraint limits the choices that businesses can make when choosing between resources in a market – in effect, desire, measured by opportunity cost, is limited by a budget constraint. The existence of a budget constraint is a reflection of the distribution of resource-buying capacity throughout an economy. In some economies this distribution might be state-controlled, in others it is left to competitive forces. In a market economy the allocation of scarce commercial property resources is facilitated by means of a **market**. In economic terms a market has particular characteristics; there are lots of decision-makers (businesses in our case) and they behave competitively; any advantage some might have in terms of access to privileged information for example does not continue beyond the short-run. Each business will have particular preferences or requirements and a budget and these will influence the price that can be offered for property and consequently the quantity obtained.

Let's simplify the commercial property market for a moment to one where land-owners supply properties and businesses demand or 'consume' them. Suppliers interact with consumers in a market-place where property interests are exchanged, usually indirectly by means of money. The short-run<sup>1</sup> demand schedule illustrated in Figure 1.1 represents consumer behaviour and is a downward-sloping curve to



**Figure 1.1** Short-run supply of and demand for property.

show that possible buyers and renters of property demand a greater quantity at low prices than at high prices (assuming population, income, future prices, consumer preferences, etc. all remain constant). The short-run supply curve maps out the quantity of property interests available for sale or lease at various prices (assuming factors of production remain constant).<sup>2</sup> The higher the price that can be obtained the greater the quantity of property that will be supplied. Equilibrium price  $P^*$  is where demand for property equals supply at quantity  $Q^*$ . Price varies directly with supply and indirectly with demand.

The result of an efficiently functioning commercial property market in the long-run should be economic efficiency, achieved when resources have been allocated optimally. Profit has been maximised and property resources could not be reallocated without making at least one consumer or business worse off, a concept known as Pareto optimality.

But what do businesses demand commercial property for? Property is demanded, and therefore leased or purchased, not for its own sake but as a means to an end; typically, as far as commercial property is concerned, for the production capabilities it offers, the services it supports or the profit it might generate. Demand of this type is known as **derived demand**. This is an important concept as it explains some of the complexity associated with valuation, especially as commercial property offers different utility opportunities for developers, occupiers and investors. This utility value is usually measured in monetary terms and might take the form of a rental value in the case of a tenant or a capital value in the case of an investor, developer or owner-occupier. So commercial property, particularly in its undeveloped state, is a resource that is combined with other resources to produce goods and services that businesses desire. Economists tend to refer to these resources as **factors of production** to emphasise that various factors need to be combined to produce goods or services. The factors of production are usually classified into three groups: land, capital and labour, and sometimes entrepreneurs are specifically identified as a fourth category. To construct a building labour is required to develop a plot of land, and plant and equipment, which may be hired or bought, is required to facilitate the process. These manufactured

resources are called capital or, more precisely, **physical capital**. Each factor of production receives a specific kind of payment. Landlords, who provide the use of land over time, receive rent. Owners of physical capital receive interest, workers receive wages and the entrepreneur gains profit. It is interesting that Marxists challenge the logic of this model as they understand land to be a gift of nature – a non-produced resource – that exists regardless of payment. From a pure Marxist perspective, therefore, land has no value and all property is regarded as theft! Indeed it is too easy to forget that the state or some collective arrangement could own and allocate land.

The Appraisal Institute (2001) summarises the situation: a property or, more correctly, a legal interest in a property, cannot have economic value unless it has *utility* and is *scarce*. Its value will be determined by these factors together with *opportunity cost* and *budget constraint*. The way these four factors interact to create value is reflected in the basic economic principle of supply and demand, and valuation is the process of estimating the equilibrium price at which supply and demand might take place under ‘normal’ market conditions. Property, then, is required to produce goods and services and enters the economy in many ways. Capitalist market economies have developed systems of private property ownership and occupation and the trading of property rights between owners and occupiers as a means of competitive allocation. Economists try to understand the nature of payments that correspond with the trading of these property rights and this is, from an economic perspective at least, the essence of valuation.

## 1.2 The property market and price determination

This section introduces three inter-related economic concepts concerning the use of land for commercial activity:

- a) The payment in the form of rent that is made for the use of land.
- b) Different rents for different land uses; competitive bidding between different users of land means that each site is allocated to its optimal or profit-maximising use.
- c) Variation in land use intensity.

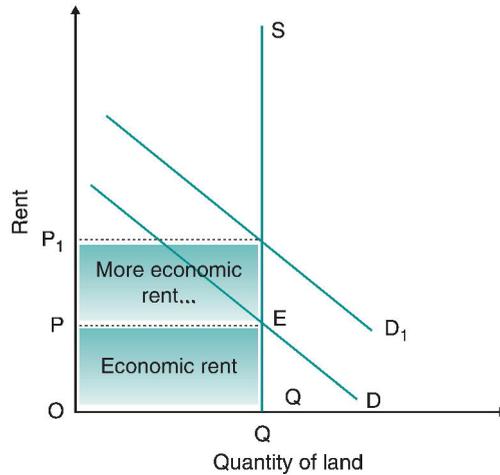
### 1.2.1 Rent for land

Commercial property has certain economic characteristics that distinguish it from other factors of production. It actually has two components; the land itself and (usually) improvements that have been made to the land in the form of buildings and other man-made additions. This has several implications, not least the existence of a separate market in land for development, which we will discuss in more detail later. Each unit of property is unique; it is a heterogeneous product, if only because each land parcel on which a building is sited occupies a separate geographical position. This means that it will vary in quality – for urban land this is largely due to accessibility differences but will also differ in terms of physical attributes, legal restrictions (different lease terms for example) and external

influences such as government intervention in the form of planning. Property tends to be available for purchase in large, indivisible and expensive units so financing plays a significant role in market activity. Also, because of its durability, there is a big market for existing property and a much smaller market for development land on which to build new property. We also know that, in the UK, about half of the total stock of commercial property is owned by investors who receive rent paid by occupiers in return for the use of property. The other half own the property that they occupy but we can assume that the price or value of each property asset is the capitalised value of rent that would be paid if the property was owned as an investment. This means that we can focus our economic analysis of price determination in the property market on rental values and assume that capital values bear a relation to these, a relationship which will be described in detail in Chapter 4.

Early classical economists regarded rent as a payment to a **landlord** by a **tenant** for the use of land in its ‘unimproved’ state (land with no buildings on it), typically for farming. The classical economist Ricardo (1817) set out a basic theory of agricultural land rent. The theory implied that land rent was entirely demand-determined because the supply of land as a whole was fixed and had a single use (to grow corn). The most fertile or productive land is used first and less productive land is used as the demand for the agricultural product increases. Rent on most of the productive land is based on its advantage over the least productive and competition between farmers ensures the value of the ‘difference in productivity of land’ is paid as rent (Alonso, 1964). Rent is therefore dependent on the demand (and hence the price paid) for the output from the land – a derived demand.

Now consider price determination in the market for new urban development land. Applying marginal productivity theory, land is a factor of production and a profit-maximising business in competitive factor and product markets will buy land up to a point at which additional revenue from using another unit of land is exactly offset by its additional cost. The additional revenue attributable to any factor is called the marginal revenue product (MRP) and it is calculated by multiplying the marginal revenue<sup>3</sup> (MR) obtained from selling another unit of output by the marginal product<sup>4</sup> (MP) of the factor. If other factors of production are fixed, as more and more land is used, its MP decreases due to the onset of **diminishing returns**. So if MR is constant and MP declines, the MRP of land will decline as additional units of land are used *ceteris paribus*. The declining MRP can represent a firm’s demand schedule for the land factor as shown in Figure 1.1.<sup>5</sup> If the price of land falls relative to other factors of production, demand will increase; that is why the demand curve in Figure 1.1 is downward-sloping. If the productivity of land or the price of the commodity produced increases then demand for all quantities of land and hence the rent offered would rise (the demand curve would shift upwards and to the right from D to D<sub>1</sub>, as illustrated in Figure 1.2. On the supply side the situation is a little more unusual. In a market for a conventional factor of production or end-product, the supply curve would be upward-sloping as illustrated in Figure 1.1, but the supply of all land is completely (perfectly) inelastic and cannot be increased in response to higher demand – the only response is higher price. Price therefore is solely demand-determined.



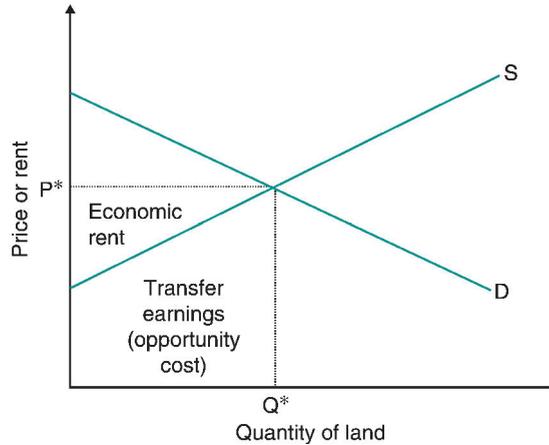
**Figure 1.2** Elastic demand and inelastic supply of land for a single use using Ricardian Rent Theory.

Whatever the level of demand, supply remains fixed, the opportunity cost of using land is therefore zero and all earnings from the land (represented in Figure 1.2 by the area OPEQ) is **economic rent** – that part of earnings from a factor of production which results from it having some element of fixed or inelastic supply and there is competition to secure it (Harvey and Jowsey, 2004).

Ricardian rent theory applies to land as a whole since the ultimate supply of all land is fixed, that is why the supply curve is perfectly inelastic (vertical) and all rent is economic rent. But demand for urban development land (as for all commercial property) is a derived demand and, because each unit of land is spatially heterogeneous, different businesses will demand land in different locations for different uses. Consequently they will be able to pay a price for land that depends on the revenue they think they can generate and the costs they will incur in the process. As Harvey (1981) puts it, users compete for land and offer, in the form of rent, the difference between the revenue they think they can generate from using the land and the costs of production (including their **normal profit**). So we can adapt the above theory to take into account different businesses wishing to use land in various locations in different ways.

### 1.2.2 Land use rents

The supply of land for a particular use will not be fixed (perfectly inelastic) unless, of course, it can only be used in one way. This is because, in response to an increase in demand, additional supply could be bid from and surrendered by other uses if the proposed change of use has a value in excess of its existing use value. The payment to the landowner for the use of land is still made in the form of rent but, since land can be used for alternative uses, supply is no longer perfectly inelastic and has an opportunity cost. Land rent, rather than comprising economic rent only, can now be considered to consist of two elements: **transfer earnings**; a minimum sum or opportunity cost to retain land in its current use, which must be



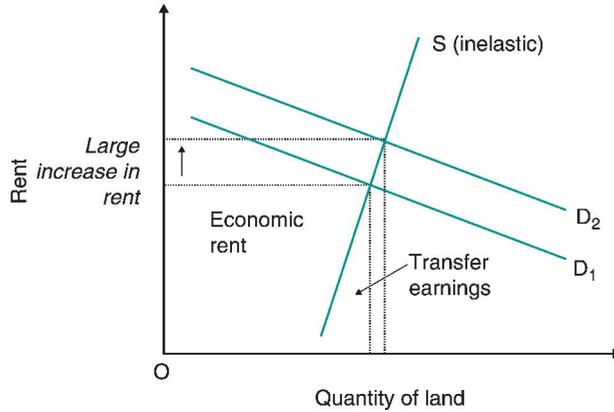
**Figure 1.3** Elastic supply and elastic demand.

at least equal to the amount of rent that could be obtained from the most profitable alternative use, and economic rent; a payment in excess of transfer earnings that reflects the scarcity value of the land.

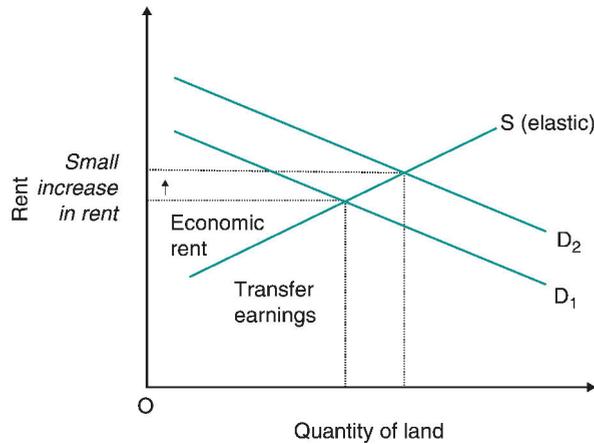
Diagrammatically, the supply curve is no longer vertical; instead it is upward-sloping. Figure 1.3 illustrates the demand for and supply of land for a particular use, warehousing perhaps. Assuming competition between users of land, interaction of supply and demand will lead to a supply of  $Q^*$  land for this particular use, all of which will be demanded and for which the market equilibrium rent will be  $P^*$ . Because supply is not perfectly elastic, some of this rent is transfer earnings and the rest is economic rent. If the rent falls below the transfer earnings then the landowner will transfer from this land use or at least decide to supply less of it.  $Q^*$  is the marginal land and is only just supplied at price  $P^*$  and all of the rent is transfer earnings. Assuming a homogeneous supply, the interaction of supply and demand leads to an equilibrium market rent for this type of land use and competition between uses ensures that this rent goes to the optimum use (Harvey, 1981).

The amount of price shift in response to a change in supply will depend on the elasticity of supply, the more inelastic the greater the change in price. Using this neoclassical land use rent theory it is possible to look at the interaction between supply and demand more closely in order to understand the nature of the rent payments for different land uses. Figure 1.4 shows that the rent for retail land use is almost entirely economic rent in the centre of an urban area. Commercial floor-space that is restricted in supply such as shops in Oxford Street in London or offices in the West End of London command a high total rent that is almost entirely made up of economic rent because of the scarcity of this type of space in these locations.

The more elastic supply of land for industrial use on the edge of an urban area means that the lower commercial rent for industrial floor-space is largely transfer earnings, see Figure 1.5. The proportion of transfer earnings and economic rent depends on the elasticity of supply of land: the more inelastic the supply, the higher the economic rent whilst the more elastic the supply, the higher the transfer earnings. Because urban land is fairly fixed in supply (inelastic) and is increasingly



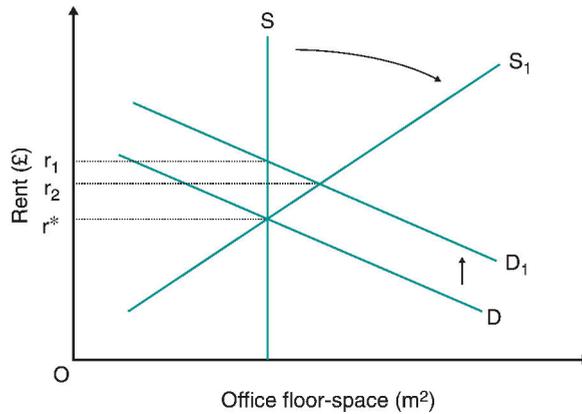
**Figure 1.4** Rents for retail land in the central area under conditions of inelastic land supply.



**Figure 1.5** Industrial land rents on the edge of an urban area under conditions of elastic land supply.

so near the centre, economic rent forms an increasing proportion of total rent as the centre of an urban area nears. So any increase in demand (or reduction in supply) for central sites is reflected in substantial rises in commercial rent, but on the outskirts an increase in demand (or decrease in supply) for land for a specific purpose only produces a small change in economic rent (and thus total rent as a whole) because land is less scarce.

Before moving on we will consider the effect of time on the elasticity of supply of and demand for commercial land. Taking office land as an example and using conventional equilibrium analysis, in the short-run, supply will be inelastic<sup>6</sup> ( $S$  in Figure 1.6) and demand represented by  $D$  will be elastic, producing an equilibrium rent,  $r^*$ . If demand for offices increases to  $D_1$  (perhaps an economic upturn has meant that more employees have been recruited and there is a demand for more space), rent will rise to  $r_1$ . In the long-run, supply adjusts in response to this



**Figure 1.6** Equilibrium analysis of rent for office space (after Fraser, 1993).

increase in demand because the increase in rent improves the profitability of property development activity. The assumption of inelasticity can therefore be relaxed and the supply of office land will increase to say  $S_1$ , settling rents back to  $r_2$ , assuming no further change in demand. It should be noted that this is a very simple model of a complex market that is seldom in a state of equilibrium (Fraser, 1993).

It is now time to turn our attention to the use of land *and* buildings (property) as a collective factor of production. The first thing to point out is the dominance of the existing stock of property over new stock. Because property is so durable it accumulates over time and new developments add only a tiny amount to the existing stock. Consequently new supply has negligible influence on price. Nowadays we think of urban rent as a payment for ‘improved’ land – typically land that has been developed in some way so that it now includes buildings too. Economists refer to this concept of rent as **commercial rent**. If the property is leased to a tenant then the rent would include not only a payment for the use of the land but also some payment for the interest and capital in respect of the improvements that have been made to the land. But it is not easy to distinguish the rent attributable to buildings from that attributable to land. Land is permanent and although buildings ultimately depreciate, they do last a long time. It can be assumed therefore that land and buildings are a fixed factor of production in any time-frame except the very long-run which the user can combine with variable amounts of other factors (labour, capital and enterprise) to undertake business activity. We have also established that, in absolute terms, the physical supply of *all* land is *completely* inelastic and the supply of land for *all commercial uses* is *very* inelastic. The supply of land and buildings (or property) for *specific commercial uses* is *relatively* inelastic in the short-run due to the requirement for planning permission to change use and the time it takes to develop new property, but less so in the long-run as development activity reacts and changes in the intensity with which land is used are possible. Nevertheless, compared to the other factors of production, supply of property is the least flexible. So, because of the negligible influence on price of new supply, demand is the major determinant of rental value.

### 1.2.3 Land use intensity

It was stated above that the quantity of land that a user demands depends not only on its price and the price of the final product but also on its productivity. The productivity of land can usually be increased in response to increased demand (or a price rise) by using it more intensively through the addition of capital. In economic terms we can add units of other factors of production (labour but, particularly, capital) to the fixed amount of land. As we are dealing with commercial property we are typically referring to the addition of building area or floor-space to a unit of land rather than, say, the addition of fertiliser to farmland. This idea was first expounded by Alfred Marshall (1920) who argued that as demand for a piece of land increases it will be worthwhile providing more accommodation on the site, in other words using it more intensively). By providing more accommodation on a site, land area is being substituted by building area. The relative cost of land and building will determine the extent of this substitution. If land is cheap it will not take much extra building before it will pay to acquire more land to provide more accommodation. Whereas, if land is expensive, a large amount of building may take place before building costs increase to a level at which it pays to acquire more land to provide extra accommodation. It must be borne in mind though that the process of adding more and more capital to a fixed amount of land will be subject to the principle of diminishing returns. Marshall used the phrase '*the margin of building*' to describe that accommodation which it is only just worth obtaining from a given site and which would not be obtained if land were less scarce. This extra accommodation was likened to the top floor of a building which, by erecting this floor instead of spreading the building over more ground, yields a saving in the cost of land that just compensates for the extra expense. The revenue that the accommodation on this top floor provides is just enough to cover its costs without allowing anything for rent. In other words the marginal revenue from this floor equals its marginal cost.

So, for each unit of land, the land use rent theory must simultaneously allocate the optimum (profit maximising) use *and* intensity of that use. We have already examined *allocation of land use* so now let us concentrate on the *intensity of land use*. Assume that the optimum land use of a particular site has already been determined. This means that land is a factor of production which has a fixed cost. What we want to know is the optimum amount of capital (which, it is assumed, means building floor-space) to add to the land. In other words, how intensively should the land be used or how much floor-space should be added to the site to maximise profit? Assuming that perfect competition in the capital market keeps the cost per unit of capital the same regardless of the quantity required, as more capital (floor-space) is added to the fixed amount of land, initially the MRP of the land might increase because of economies of scale but the law of diminishing returns means that eventually it will fall. Profit is maximised where the MRP of a unit of capital equals the marginal cost of a unit of capital, in Figure 1.8 this is when OX units of capital are employed. If the business employs less than this amount the MR earned by an extra unit exceeds its MC and if more are employed the MC of each unit in excess of OX will be higher than its MR. OX is therefore the optimum amount of capital to combine with the land. The total revenue earned is represented by the area QYXO. Total cost (including profit) is area