A classification of property investment depreciation and obsolescence

1. Depreciation and obsolescence

The literature review described in Chapter 3 is dominated by non-academic and non-theoretical references to depreciation and obsolescence. There is no discernible development in UK works of a body of knowledge and theory which defines and classifies these twin concepts, outside the mass of literature in accounting which concentrates upon the techniques used in the application of depreciation to profit and loss accounts, and a partial definition embodied in the RICS Asset Valuation Standards Committee guidelines (see Chapter 3).

In North America, on the other hand, the impact of depreciation upon investment return has for many years been very great as a result of two factors. First, accelerated depreciation allowances against income taxation have until recently differentiated property investment from other investment vehicles and raised consciousness of depreciation among real estate academics and professional practitioners. Second, the standard three values approach to appraisal in North America has meant that the cost approach is used much more in property valuation than it is in the UK, and depreciation is an important element in that approach (see Chapter 3).

Considerable confusion surrounds the use and definition of the two terms, depreciation and obsolescence, in UK references. An early example of UK definitions is provided by Chapman (1973) who defines depreciation as a “fall in value, hence, in accounting depreciation is the reduction in the value of an asset through wear and tear or obsolescence; the latter term is the drop in value of an asset which has passed its peak of use or productivity.” This is helpful, but the clarity of definitions appears to have retarded since then. The two terms are sometimes used interchangeably (for example, Debenham, Tewson and Chinnocks, 1985; see Chapter 3) and usually without precision. In North American real estate texts, however, there are invariably attempts to establish a simple definition and classification of depreciation, the generic term, and obsolescence, a contributing factor.

Wofford (1983) defines depreciation and categorises its three sources as physical deterioration, functional obsolescence and economic or locational obsolescence:

**Depreciation**, as used in appraisal, is the loss in value from any cause. The sources of depreciation may be categorised into three classifications: physical deterioration, functional obsolescence, and economic obsolescence. **Physical deterioration** is the loss in value due to the actual *wearing out* of the improvements. **Functional obsolescence** is the inability of an improvement to perform the job for which it is designed. For instance, the increased use of computer equipment calls for office buildings with adequate air conditioning and floors strong enough to support the weight of the machines. Buildings built several years ago that do not have these capabilities suffer from depreciation from functional obsolescence.

**Economic obsolescence**, also called *locational obsolescence*, is the loss in value due to factors outside the property itself. For example, the deterioration of a neighbourhood may reduce the value of a home. Likewise, changes in traffic patterns may reduce the value of a retail store...
Wurtzebach and Miles (1984) follow a similar structure, but produce a more detailed definition and classification. First, their definition is more specific:

The concept of depreciation is pervasive in real estate. It is meant here as an appraisal or valuation concept, and it is met again in later chapters as an accounting concept and then as a tax concept. As used here, *depreciation* refers to reduction in the value of buildings or improvements as a result of physical, functional or economic factors.

Second, they split physical depreciation (not deterioration) into curable and incurable elements:

Physical depreciation may either be *curable* or *incurable*. Curable physical depreciation is also known as *deferred maintenance*, because the primary cause of such depreciation is the failure of the owner to maintain the property on an ongoing basis. Such depreciation is called *curable depreciation* because the cost of eliminating or correcting it is less than or equal to the value that will be added to the property as a result. Most items of *normal* maintenance come under this heading.

Examples of curable physical depreciation include replacing broken windows, painting the exterior and interior of a house, and cleaning and making minor replacements to the furnace. In all of these cases, the cost to cure is relatively small and is undoubtedly justified (in an economic sense).

The other type of physical depreciation is that which is incurable. The term *incurable* does not refer to the impossibility of curing the defect, since virtually any physical defect can be repaired or replaced, but to the lack of economic justification in doing so. Physical depreciation is considered *incurable depreciation* if the cost to cure or correct the physical defect is greater than the value that will be added to the property as a result.

Their distinction between curable and incurable depreciation is based on an economic test. Incurable depreciation must also include apparent physical impossibilities (increasing slab-to-slab height, for example) but, as it is usually possible to demolish and rebuild, an economic test is probably all that is needed, and for that reason it is adopted within this book.

They also suggest that the terms functional obsolescence and functional depreciation are interchangeable (and that such a factor may again be curable or incurable) and that economic or locational depreciation is an alternative for economic obsolescence. This is less helpful.

Shenkel (1984) uses the terms physical depreciation, functional obsolescence and economic obsolescence, and confirms a (to date in this introduction) missing detail:

Economic depreciation also is not curable. The examples (in the text) refer to environmental or neighbourhood factors that reduce a dwelling’s value. Economic depreciation is not curable since it is difficult to remove these deficiencies by modernisation or rehabilitation of the property appraised.

The rare UK attempts at definition (for example, Bowie (1982)) appear to be straightforwardly derivative of the mainstream North American literature. There are, however, exceptions. For example, Fraser (1984) uses the term *economic obsolescence* to explain under-utilisation of a site (see below). The RICS Asset Valuation Standards Committee guidelines (RICS, 1988), on the other hand, define economic obsolescence as *the age and condition of the existing building and the probable cost of future maintenance as compared with that of a modern building*, which appears close to the North American definition of physical depreciation. The RICS definition of functional
obsolescence – suitability for the present use and the prospect of its continuance or use for some other purposes by the business - is much closer to Wofford's definition, while Shenkel's definition of economic depreciation is also close to the RICS term - environmental factors (existing uses should be considered in relation to the surrounding area and local and national planning policies), although this does introduce, like Fraser, the effect of planning policy into the classification.

In conclusion, there is a considerable degree of confusion surrounding definitions of depreciation and obsolescence. Given the superior level of development of the North American classification and the lack of a consistent UK alternative, it is the North American system which provides the best starting point. In confirming this view by implication, Salway (1986) follows a similar, but more detailed, system of classification in the CALS report (see below).

Depreciation and obsolescence: definitions

Basic definitions are an essential pre-requisite not only to an understanding of the subject under examination but also to the construction of a model for its analysis. A full list of definitions is provided in Appendix A. The following basic definitions are derived from the North American school and an accounting definition of obsolescence in Baxter (1981), similar to that used in Salway (1986). They clearly distinguish depreciation as the effect, and obsolescence as the cause.

**Depreciation is a loss in the real existing use value of property.**

**Obsolescence is one of the causes of depreciation. It is a decline in utility not directly related to physical usage or the passage of time.**

Much of the perceived complexity of depreciation is related to the fact that an obsolescent property investment can increase in value, whereas the popular understanding of obsolescence is that it causes a decrease in value. Two factors explain this apparent problem.

Firstly, in a period of inflation property rents generally increase while yields might remain relatively stable (see Tables 5 and 6 in Chapter 3). As a result, obsolescence may be reflected not in falling values but in under-performance in relation either to inflation or to an index of prime property values. This explains the use of the word real in each of the above definitions. A loss in real value - depreciation - may therefore be explained as under-performance in relation to an index of newly-prime properties.

Secondly, obsolete property can increase in real value as a result of advantageous planning decisions, such as permission for increasing the plot ratio of an office site. Obsolescence for the purposes of this research is quite independent of this factor, but confusion is created by the use by some writers (for example, Fraser, 1984) of the term economic obsolescence to explain under-utilisation of a site resulting from (for example) a valuable planning consent. This term is of no help in this analysis. According to this definition of economic obsolescence, a brand new, state-of-the-art low density development may be obsolete as it is built. To the investor who purchases the building secondhand this is not a factor which would be seen as a cause of depreciation. What is therefore of interest is obsolescence leading to depreciation in the real existing use value of a property investment.

**Tenure-specific and property-specific depreciation**

Depreciation in the real existing use value of a property investment may result from tenure-specific or property-specific factors. Tenure-specific factors are the results of leases, tenancies and statutes
which restrict or encumber the investment. Property-specific depreciation, on the other hand, affects the property regardless of tenure.

Figure 1 shows these two sources of depreciation in real existing use value. The remainder of this chapter explains the expansion of the taxonomy.

An example of tenure-specific depreciation is the short leasehold, as its value falls purely as a result of the passage of time. (Note that this is not an obsolescence factor in the terms of the basic definition.) Down-rating of the quality of a tenant’s covenant leading to increases in required yield is another example of depreciation which cannot be described as an obsolescence factor.

Tenure-specific depreciation is not of interest in this book. It is depreciation resulting from the property itself which forms the subject of this study. Assuming that subject properties are unencumbered freeholds with identical tenants and tenancies ensures that property-specific factors only will be considered.

*Figure 1: A classification of depreciation and obsolescence*

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**Site and value changes and building depreciation**

The existing use value of a property investment may be notionally split into two parts: site and building. While the site value may increase or decrease in real terms over time as the result of a complex series of factors, the building value *must* decrease or depreciate in real terms.

Site depreciation is a misleading term because of this distinction. Site value changes may be caused by general demand/supply factors. These include the general level of economic activity; the
general level of activity in the property market; the level of activity in the particular sector of the property market under consideration; and local activity in that sub-market.

The residual model of site value determination (see, for example, Darlow (1983)) states that the value of a site is equal to the value of the completed development less demolition and construction costs (including profit). If the market is buoyant, the value of the completed development will rise as rental values rise. If, as would be expected, there is no immediate and direct link between market forces of supply and demand for completed buildings and their construction costs, then costs would remain constant in the short term, causing the whole of the increase in value resulting from an upturn in the market to fall upon the site value. This may be illustrated by an example. The current value of a completed development is estimated to be £1,000,000 but increases over a period to £2,000,000. The development cost (including demolition costs and profit) is £400,000 and remains constant over the period. The residual site value is therefore initially £600,000 but increases to £1,600,000.

The whole of the £1,000,000 increase in completed development value falls upon the site; the notional building value therefore remains unaffected by demand/supply changes.

This proposition is supported by both the Ricardian/post-Keynesian/Marxian and the neo-classical schools of value theory (Lichtenstein, 1983). The former objective theory is based on the labour theory of value, which asserts that value is production-driven. Given that land has no cost of production and no labour is embodied within it, rewards to land are in the nature of a surplus. The rental value of a property is made up of a de-capitalised, labour-embodied building cost and a surplus, which may be assigned to the pure land element. In the example above, it is short term fluctuations in the price of the completed development which are assigned to the land element.

Using the latter, neo-classical, subjective theory of value, rental value is a function of demand and supply. Against the background of a short term relatively fixed supply, and given that the demand for office space is a derived demand, the rental value of office space in the City of London in the short term will depend largely on the demand for financial services. If the demand for financial services increases, occupational demand may rise relative to supply, and rent will increase. The cyclical nature of occupational property markets results in fluctuating site values as rent increases and reduces in response to changes in the level of occupational demand. In contrast, the building depreciates; similar new buildings constructed upon identical quality sites are observed to attain higher rents.

Figure 2 illustrates this notional split by assuming straight-line building depreciation and constant site value over time and showing the point at which redevelopment is viable.

*Figure 2: Redevelopment viability analysis*
Simplistically, the point at which redevelopment becomes viable is when the site value exceeds the value of the existing property (building and site). However, it is necessary to distinguish between cleared site value and the value of the site with an obsolescent building upon it. Cleared site value is equal to the value of the site with obsolescent building less the cost necessary to clear the site. Redevelopment is therefore not viable at point X: existing use value (= V2) exceeds development value (= V2 - V1), and the building cannot be said to be worthless or obsolete. At point Y, however, development value (= V1) and existing use value (= V1) equate, so that this is the point of redevelopment viability, and at this point the building is obsolete.

The total value of a property comprises depreciated building value (initially V3-V1, falling to V1 at the point of redevelopment), plus cleared site value (V2), less demolition costs (V2-V1). Thus, where TV = total property value, DBV = depreciated building value, CSV = cleared site value and DC = demolition costs,

\[ TV = DBV + CSV - DC \]

Thus:

\[ DBV = TV - CSV + DC \]

At the point of redevelopment:

\[ DBV = 0 \]

So that:

\[ TV = CSV - DC \]

In words, at the point of redevelopment the total property value is equal to the cleared site value less demolition costs. Given that the site may also fall in value, there are therefore two sources of property-related depreciation: site value changes and building depreciation.

**Site value changes**

Site value changes are the result of two factors. These are the result of the surplus/supply and demand relationship referred to above, and of *environmental obsolescence*. This is the factor referred to as economic or locational obsolescence in the previous discussion of the North American tradition embodied, for example, in Wurtzebach and Miles (1984) and must be distinguished from the obsolescence created by favourable re-zoning referred to by Fraser (1984) as economic obsolescence.
The term environmental obsolescence will be used from here on to describe the diminished utility and hence value of property due to negative environmental forces in the surrounding area. This may include changing use in the location, or unattractive neighbouring buildings. The result is a depreciation in site value. (A parallel is provided by the term worsenment (Davies, 1985).)

**Building depreciation**

Building depreciation is also the result of two distinct factors. Physical deterioration may be defined (following Wofford, 1983) as deterioration of the physical fabric of the building as a function of use and the passage of time, while obsolescence is differentiated (by Baxter, 1981) as a value decline not directly related to use or the passage of time. These are the broad definitions employed by Salway (1986) in the CALUS report. These distinguishing definitions are not yet acceptable, however. The action of the elements is an important consideration in the physical deterioration of buildings not referred to by Salway. Additionally, it is difficult to see how the passage of time creates deterioration other than as a result of use or the action of the elements. Hence physical deterioration is better defined as deterioration of the physical fabric of the building as a function of use and the action of the elements.

(Several writers, for example Baxter, 1981, refer to the physical life of a building as if it were a measurable function of physical deterioration. This concept should be rejected. Unless the structure actually collapses, physical life becomes testable only in economic terms, as it is dependent upon the relationship of maintenance costs, rental values and other factors. This is supported by Wurtzebach and Miles (1984).)

Obsolescence, in contrast to physical deterioration, is a value decline not directly related to use, the action of the elements, or the passage of time. Obsolescence may be instantaneous as a result of a technological advance. It results from change which is extraneous to the building in question, such as changing market perceptions about such factors as quality and design.

Figure 1 shows the divisions between supply/demand factors and environmental obsolescence, and between physical deterioration and obsolescence as causes of site value change and building depreciation respectively. (It is not suggested that the preferred distinctions between site value change and building depreciation and between site and building value are perfect, and problems may arise in assigning both value and causes of depreciation to one to the exclusion of the other. For example, the effect of changing car parking requirements on the value of a property may be more accurately assigned to the relationship of the building and its site rather that to either factor in isolation.)

2. **Forms of building obsolescence**

**Introduction**

Typical US analyses of depreciation split building-related depreciation factors into two categories: physical deterioration and functional obsolescence. For the purposes of this research, as stated above, it is agreed that physical deterioration is too narrow a concept to cover all causes of building depreciation. Building obsolescence (including functional obsolescence) appears to be more important, and requires more exploration.

**Categories of building obsolescence**

Salway (1986) refers to further categorisations of building obsolescence. These are as follows:
i. aesthetic (or visual) obsolescence, resulting from outdated appearance;

ii. functional obsolescence, the product of technological progress which causes changes in occupiers’ requirements, impinging upon both layout and facilities offered;

iii. legal obsolescence, resulting from the introduction of new standards (for example, safety regulations); and

iv. social obsolescence, resulting from increasing demands by occupiers for a controlled environment and improved facilities.

Legal and social obsolescence can be regarded as sub-sets of functional obsolescence, which is thereby to be distinguished from aesthetic obsolescence. It is therefore possible to identify two major obsolescence types: these are functional obsolescence and aesthetic obsolescence.

It is now necessary to progress towards a model which can be used for the measurement of these two types of obsolescence. By breaking down the qualities of a building and their susceptibility to obsolescence, it is possible to move beyond a conceptual, and towards a practicable, model for its examination.

It is proposed to examine, first, how these two major obsolescence types act upon a building and second, the extent to which the major qualities of a building are subject to obsolescence.

3. Building qualities

The following distinction between three fundamental determinants of building quality is suggested as a useful basis for analysis by commentators on building design and depreciation reviewed in Section 2 of Chapter 3.

1. The external appearance, entrance hall and common parts of the building together produce a psychological and visual impact which may alter as market perceptions of design quality change, acting through aesthetic obsolescence to create building obsolescence.

2. The internal specification, affecting both the quality and quantity of finishes and services, will have both an aesthetic and functional impact as market demands change. The appearance of the interior may become inferior as fashions change, while the productivity of those who work in the building may be inhibited by outdated services and fittings. Both aesthetic and functional obsolescence result.

3. As technology progresses, buildings need to be sufficiently flexible to cope with raised floors, suspended ceilings, revised internal layouts and so on. A lack of flexibility is a source of functional obsolescence as the demands of a market change. Configuration is the horizontal and vertical layout of a building, which acts largely through functional obsolescence to make a building less useful (obsolescent) as requirements change.

Of the three building qualities noted above (external appearance, internal specification and configuration) certain qualities may be susceptible to both obsolescence and physical deterioration, so that a classification of the causes of obsolescence is less than straightforward. The external appearance of a building, for example, will be affected by obsolescence as fashions change, but also by deterioration, so that depreciation resulting from external appearance is a function of both factors. Similarly, internal specification and services will be subject to both obsolescence and deterioration. Of the three sources of obsolescence, only configuration is unaffected by physical deterioration. Depreciation is the combined result of obsolescence and deterioration.

4. A full taxonomy
A study of the literature relating to the building design aspect of depreciation (see Chapter 3, Section 2) shows that each of the basic building qualities (external appearance, internal specification and configuration) naturally breaks into further sub-factors and that a further distinction based on these subdivisions may be useful.

Firstly, external appearance is a function not only of the pure external design but also of the entrance hall to the building, which is clearly perceived as part of the ëexternalí image. Individuals feel external to the building until admitted past the reception desk (see Healey and Baker, 1987).

Secondly, internal specification affects both the design and quality of internal finishes (doors, walls and so on) and the design and quality of services (lifts, air conditioning, and others) (see Ferguson, 1987).

Thirdly, configuration is a function of both horizontal and vertical layouts, in other words of plan layout and of floor-to-ceiling heights (see Worthington, reported in Chapter 3, Section 2, and Pepper and Morgan, 1986).

Figure 1 shows the developed complex relationship of deterioration and obsolescence and of external appearance, internal specification and configuration, and the breakdown of the latter three factors into twin factors (external design and impact of entrance/common parts, internal finishes and services, and floor-to-ceiling heights and floor layout). These could be further classified into sub-factors for a more detailed analysis.

It has to be accepted that the classification shown in this model is neither finite nor beyond debate. For example, functional obsolescence may be difficult to divorce from aesthetic obsolescence as worker productivity will depend upon the design of a building as well as its environmental quality. Configuration, while shown as an input into functional obsolescence, might for similar reasons be a minor determinant of aesthetic obsolescence. In addition, environmental obsolescence is not easily divorced from supply/demand factors when the latter are defined to include local activity in a sub-market. Such local activity may, of course, be affected by the quality of local buildings, which is a cause of environmental obsolescence.

In conclusion, this is a highly complex area. Nonetheless, the classification developed in this chapter facilitates a meaningful examination of the relative importance of the broad sources of property investment depreciation. In summary, obsolescence is a cause; deterioration is a cause; depreciation is the effect.