

BUILDING ECONOMICS  
DEPRECIATION & OBSOLESCENCE

Ivan M. Johnstone BSc, BArch(Hons), PhD  
2004

PRIMARY SOURCES:

- Baum, A. Property Investment Depreciation and Obsolescence. Routledge, 1991.  
Inland Revenue Department. IRD Tax Information Bulletin - Appendix to Volume Four, No. 9 - April 1993.  
Lu, F.P.S. Economic Decision-Making for Engineers and Managers. Whitcomb and Tombs Ltd., 1969.  
Speedy, S. Property Investment. Butterworths, 1974.  
Whipple, R.T.M. Property Valuation and Analysis. The Law Book Company Limited, 1995.

DEPRECIATION

The Concise Oxford Dictionary defines 'depreciation' as an 'allowance made in valuations, estimates and balance sheets for wear and tear'.

Accountants and valuers have two distinct applied concepts of depreciation which are respectively referred to herein as (accounting) depreciation and (economic) depreciation.

ACCOUNTING DEPRECIATION

Accounting depreciation is defined by The American Institute of Certified Public Accountants as

'a system of accounting which aims to distribute the cost or other basic value of tangible capital assets less salvage (if any) over estimated useful life of the assets (which may be a group of assets) in a systematic and rational manner. It is a process of allocation not valuation'

- By charging depreciation in instalments against the revenue of successive periods, an overstatement of profits is avoided.
- The original funds of the firm are left intact by the prevention of excessive drawings or dividend payments against capital in the belief that it is profit.
- The charging of depreciation in the accounts against revenue does not constitute a fund for replacement of assets upon the end of their useful life, as would a sinking fund.
- It is not usual commercial practice to set aside such a fund as normally all funds of a business are actively employed either as ordinary current assets or as fixed assets.

- When the time for replacement does arrive, frequently the cost of replacement is greater, due to general inflation, innovation, or improvements so that any funds set aside for replacement would be, in any event, insufficient.

## ECONOMIC DEPRECIATION

Economic depreciation is a loss in the existing real value of property.

## CLASSIFICATION OF ECONOMIC DEPRECIATION (DIAGRAM)

Economic depreciation may result from tenure specific or property specific factors.

### TENURE SPECIFIC FACTORS

Tenure specific factors are the results of leases, tenancies, and statutes that restrict or encumber the investment.

### PROPERTY SPECIFIC FACTORS.

The depreciation of existing use value of a property investment may be split into two parts – changes in site value and building depreciation.

### CHANGES IN SITE VALUE

The site value may increase or decrease in real terms over time as a result of supply and demand factors or decrease as a result of environmental obsolescence.

#### Supply and demand factors

The value of a particular property, or class of investment properties, may be affected by macro-economic forces such as changes in trade or building cycles, a direct result of government policy, or a by-product of some government policy.

The value of the completed development rises or falls as a result of rises and falls in rental values.

- The value of a cleared site is equal to the value of the completed development less construction costs, including normal profit (residual value model).
- The whole of the increase in value from an upturn in the market falls upon the site value

- (Construction costs remain constant in the short term as there is no immediate and direct link between construction costs and market forces of supply and demand for completed buildings).
- Site values fluctuate as rents increase and decrease (assuming no ratchet clauses) in response to shifts in demand.

Environmental obsolescence (economic or locational obsolescence)

Environmental obsolescence describes the diminished utility, and hence value of property, due to negative environmental forces in the surrounding area.

- It arises from causes relating to urban-economic, or situs qualities of a property's location.
- It concerns factors arising outside of the property itself but which affect the property.
- For example, changes in transport patterns, car-parking facilities, population densities, and demography can cause some locations to advance, and others to decline, with a corresponding influence on the value of the property.
- For example, a desirable residential neighbourhood may witness a loss in value if only a few houses become occupied by social deviants.
- Mixed land uses can also cause a degree of economic obsolescence. For example, the opening of a search and rescue unit may cause distress and loss of value due to the noise of its helicopter operation.
- Note that environmental obsolescence is not easily separated from supply/demand factors when supply demand/factors are defined to include local activity in a sub-market.

## BUILDING DEPRECIATION

The real value of a building declines or depreciates over time.

- Newer, but similar versions of older building constructed on identical sites to older buildings command a higher rent than older buildings.
- Building depreciation occurs when the improvement has a value less than the cost to replace it.

Building depreciation is the result of physical deterioration and building obsolescence.

## PHYSICAL DETERIORATION

Physical deterioration is deterioration of the physical fabric of the building as a function of use and the passage of time.

- Physical depreciation may be curable or incurable.

Curable physical depreciation (also known as deferred maintenance)

Curable physical depreciation when routine maintenance has been substandard or at the end of the life of an item.

The costs 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 maintenance come under this heading, for example, timber rot in fascia boards.

Incurable physical depreciation

The term incurable does not refer to the impossibility of curing the defect.

Physical depreciation is considered to be incurable depreciation if the cost to cure or correct the physical defect is greater than the value that would be added to the property as a result.

## BUILDING OBSOLESCENCE

Building obsolescence is a decline in value that is not directly related to use or the passage of time.

### CATEGORIES OF OBSOLESCENCE

Factors that underlie the economic process include perceived needs, expectations, economic values, and the prevailing economic climate.

#### Aesthetic or visual obsolescence

The loss in value of an asset, even while its utility remains unimpaired, through changes in fashion or style.

- It is purely a creation of the mind, created by changes in styling and desirability.
- Because modern buildings now employ so many manufactured components, buildings are likely to suffer from aesthetic obsolescence increasingly in the future.
- A real problem of built-in obsolescence can arise in new buildings that are merely designed to some current fad, or bizarre style that can easily date or go out of fashion.

#### Functional obsolescence

Functional obsolescence occurs when a new building would fulfil the purpose of the existing building more efficiently.

It comes about either because the original design is faulty or because there is a shift in market requirements for certain space standards.

- Functional obsolescence can be caused by deficiencies or excesses in the design of the building.
- It can relate to the poor planning of the building, its lack of efficiency in operation, use, or its unattractiveness to occupiers.
- Some functional obsolescence may be built in and be incurable, other forms may be curable only at considerable expense.
- An example of curable functional obsolescence would be the repartitioning which makes use of excessively wide corridors.
- An example of incurable functional obsolescence would be improvements erected on a site wholly unsuited to them resulting in the market value being less than the cost of development.
- A building designed for specialised use of one owner may suffer functional obsolescence if its particular characteristics did not reasonably meet those of a successor.

- Functional obsolescence can be present even when there is no physical depreciation.

#### Technological obsolescence

- Can arise when some new material or product is introduced which performs a function better.
- The best protection against technological obsolescence is to ensure that the best possible choice is made from existing products or materials.
- There is always a danger of technological obsolescence with new unproven products when they fail to live up to expectations.

#### Legal obsolescence

Can arise through legal restrictions, or obligations placed on properties by private contractual obligations; or by central or local government limiting the use of a property; or by the imposition of any unusual or abnormal restriction or requirement.

- The restriction on the use of a building by a change in zoning, or the need to provide for some new health, or safety measures, are common examples of legal obsolescence.

#### Establishment obsolescence

May occur when a commercial building is first constructed, during the initial period until it is fully let or fully established as a business, such as a multi-storeyed building, motel, or hotel.

- Between the time when the contract is let for a building, until occupied, or leased sufficiently to cover all outside commitments, the venture is at highest risk.
- Until and unless the property reaches its full lettable capacity at best rents, it will not yield its full potential and value.
- Mistakes of promotion, and mistakes in operation, are causes of establishment obsolescence.

## DEPRECIATION AS AN ALLOWABLE DEDUCTION

In New Zealand, the Inland Revenue Department recognises depreciation on buildings as an allowable deduction against taxable income.

- The depreciation rates set by the Inland Revenue Department take into account '...customary usage and obsolescence in normal circumstances'.
- There is a degree of circularity in setting allowable depreciation rates of buildings based on customary use and obsolescence.
- Depreciation deductions against income provide economic incentives that foster a useful life span of buildings that the depreciation rates were based on in the first instance.
- Depreciation is an allowance for tax purposes, to take account of the fact that assets used in a business eventually wear out or become out of date, even though they are maintained or repaired.
- In order to claim a depreciation deduction on an asset, you must own it, and it must decline in value while you use it, or have it available for use in your business. (i.e. renting it out).
- When the property is sold or disposed of, generally the difference (if any), between the sale price and the adjusted tax value is either a gain or a loss. This difference has to be accounted for in the year of disposal.
- Land cannot be depreciated for tax purposes.

## ESTIMATING (ACCOUNTING) DEPRECIATION

There are two ways you can depreciate buildings; diminishing value and straight line

### Diminishing value method (example)

Depreciation is calculated each year by using a constant percentage of the property's adjusted tax value.

- Depreciation deductions progressively reduce each year.

### Straight line method (example)

This is when a constant percentage of the cost of the asset is deducted from its adjusted tax value. This method is sometimes referred to as the cost price basis.

- The amount of depreciation claimed is the same each year.
- This method is related to economic life.
- Timber houses 2.5 % therefore 40 year economic life. However, PhD study estimates economic life to be 90 years and the economic life span to be 140 years.

## Land and buildings (example)

Where land and buildings are purchased and the price does not specify the cost of the building, The Government Valuation may be used for apportionment purposes as follows:

$$\frac{\text{Value of improvements}}{\text{Capital value}} \times \text{Purchase price}$$

## Sale of buildings (example)

- When a building is sold after 28 July 1988 for more than its adjusted tax value, the depreciation recovered is assessable income. The recovery is the smaller of:
  - The original cost price of the building, less the adjusted tax value
  - The sale price, less the adjusted tax value.
- This ensures that any capital profit made on the sale of a building is not included as assessable income.
- Losses made on the sale or disposal of buildings are not deductible.

## ESTIMATING (ECONOMIC) DEPRECIATION

According to the New Zealand Valuation department:

'Valuations carried out by valuers are in the majority of cases based on observed sales evidence. Any notion of depreciation is therefore related to the "markets" perception of the diminution of value caused by both the physical wearing out as well as economic obsolescence. Having said that however, it would be true to say that highly specialised buildings which have few if any market comparators are valued with reference to replacement cost new less an allowance for depreciation and obsolescence. The rate of depreciation that a valuer might apply is generally related to a straight-line view of loss in value over the expectation of useable life of the structure. This sort of process becomes somewhat unstable when it is quite evident that buildings may well be retained in use significantly longer than was previously expected.'

Economic depreciation may be estimated by reference to the market, where possible, or by invoking assumptions as to its incidence or by the breakdown method.

## MARKET BASED ESTIMATES OF ECONOMIC DEPRECIATION (DIAGRAM)

- In theory, where houses of a particular vintage are traded frequently, the extent of depreciation can be estimated provided the value of the land can be reliably estimated.
- A hedonic price model would be set up using variables that describe the selling prices and the physical characteristics of the properties, including the age of the dwelling. (Technically difficult to do).
- The model would be used to establish a relationship between price and age.
- In practice, there are widely varying estimates of economic depreciation of dwellings.

## ASSUMPTION BASED ESTIMATES OF ECONOMIC DEPRECIATION

It should never be assumed that depreciation taken for accounting or income tax purposes is equivalent to actual depreciation.

### Economic age-life method (example)

In the economic age-life method, depreciation is assumed to be in the ratio of effective age to economic life.

- The effective age need not be the same as the actual age.
- Rectifying curable depreciation can act to shorten the effective age.
- The economic life is the period over which the item is expected to contribute to the value of the property.
- Economic life and physical life do not necessarily coincide.
- The method is the same as straight-line depreciation except effective age is used instead of actual age.
- The method of economic age-life method assumes that all items comprising the building have the same life factors and depreciate at the same rate.
- The scrap value of the asset is assumed to be zero at the end of its life.

### Modified economic age-life method (example)

Curable depreciation is first taken out and then the balance is depreciated on the straight-line assumption.