

8 The residual method – the problem

The comparable and investment methods are the appropriate ones to use where transactional evidence of sales and lettings is readily available. However, it is often necessary to provide a valuation of undeveloped land or of land with obsolescent or otherwise unsuitable buildings incapable of producing an economic rent and where the site is ripe for development or redevelopment.

The passing rent, even where there is one, relates to the current use and probably reflects the deteriorating condition of the property. It will not assist in determining the value of the land for redevelopment (though it may be one factor in deciding whether development or redevelopment is viable at a particular time).

In essence the problem appears to be a simple one: the market is likely to relate the value of the land to the level of profitability of the proposed development. It may be that, in this quest for a value, recent sales of similar land for development will be of some assistance. For example, land for industrial development in any particular locality will tend to have a capital value within a known or identifiable range; current sale prices would reflect supply and demand related to the physical advantages and disabilities of the particular site. The best price in that market would be obtained for level sites that were well served by a local road network, close to a motorway junction and capable of easy connection to all main services.

Where there has been a recent transaction involving a site similar in all respects to the one under consideration, that is likely to prove the best evidence for the value of the site. But the chances of finding similar development site comparables are low. A difference in any material respect will tend to be reflected in a change in the unit value.

FACTORS THAT COULD AFFECT VALUE

- The geometric shape of the site, its dimensions and the road frontage for access and prominence.
- The net developable area in relation to the total site area, parts of which may be affected by planning conditions and/or restricted by service ducts, easements, overhead power cables and physical features such as steep slopes and flood plains.

- The geology and soil mechanics of the site, which may necessitate the use of a more expensive raft to cope with differential settlement or a foundation design that will accommodate heave in the case of heavy clay soils.
- The location of the site, which will be a major determinant; even adjoining sites can be subtly different.
- Planning permissions vary; they may contain conditions such as hours of business opening, onerous obligations with respect to on- and off-site works and services in the case of an outline planning permission, or may reserve a decision on certain matters pending submission of detailed proposals.
- The nature, extent and design of the proposed developments, even if both are industrial, may also be very different. One may be a high bay steel portal framed warehouse, the other a standard caves height production unit of traditional brick and steel construction.

While not exhaustive, the list demonstrates the scope for differences of significance in the factors affecting value. As a result, any attempt to determine market value by comparison pricing on a unit basis is likely to prove both unreliable and inadequate.

Value is often expressed as a capital sum per unit of measurement, but the detail of the development, the size of the site and its access, the various expenditures involved and the potential for letting are likely to ensure that comparable information of the kind mentioned is not directly applicable and acts as no more than a rough check or possibly as a useful initial way of reporting the result.

THE BASIC APPROACH

The approach most often used in valuations of development land is the residual method. Based on as much information as is available, an indication of the land value is obtained by preparing a valuation of the proposed development on completion, deducting the estimated costs of carrying out the works, including fees and finance costs. As will be seen later, that surplus is not necessarily the value of the site. Table 8.1 sets out the process in simple terms.

Difficulties arise in the use of this method because the premises have not been built, plans and costings are tentative and rents are unlikely to have been negotiated.

A valuation is being placed on a completed development on the basis of information available on current rents and yields derived from an analysis of the current market, whereas the development may not be completed for two or three years, or even longer, by which time the market may have undergone considerable changes with a consequent effect on value.

Similarly, building costs or the cost of short-term finance, or both, may be affected by external events, while any delay in the development schedule (often incurred due to complications in obtaining planning permission, or interruptions due to events such as inclement weather or an unsuccessful marketing campaign)

Table 8.1 The residual method: the main components of the development process

Preliminaries	Construction
Appoint professional team	Contractor to build
Finalize plans	Marketing campaign
Obtain detailed planning permission	Agree rents and lease terms with tenants
Negotiate building contract	
Arrange short-term finance	
Appoint building contractor	
Arrange sale of completed development	
	Post construction
	Finalize lettings
	Fit out units (tenants' responsibility)
	Complete sale of development when fully let
	Repay short-term finance

is likely to have serious financial implications, especially when the cost of short term finance is high. So, while no value profile should give a false impression of its degree of accuracy or certainty, it behoves the valuer to take great care to ensure that all data used are based on the highest quality of information available.

The great advantage of the approach is that it mimics the way in which the market considers the problem: in other words, it is a market approach.

Where the land is already owned by the developer or the price has been agreed or is fixed, a variation of the method may be used. The known information could be used to determine the maximum amount available for building costs, the minimum net rent required from the completed works or the gross profit likely to result from the development. In each case, the objective is the same: to establish whether a development of the site is viable according to the criteria available (some, such as rents and yields, market-derived; some, such as the precise terms of any planning permission, externally proposed; some stipulated by the particular developer).

The criticisms

On many occasions, the Lands Tribunal has expressed serious reservations about the use of the method, which is often used by expert witnesses in cases of compulsory acquisition referred to the tribunal when the parties have been unable to agree the compensation to be paid.

In the following extracts from the decision of the tribunal in *Clinker & Ash Ltd v. Southern Gas Board (1965)* the remarks are directed primarily at cases where the market will not be tested because the land is needed for purposes for which compulsory powers are available. The normal operation of the market is first described and then contrasted with the situation before the tribunal, when only two parties are involved and the acquisition of the site is not exposed to the normal negotiating procedure.

From the viewpoint of a valuer who is retained by an intending vendor and who has therefore a responsibility to ensure that his client obtains not less than the full value of his land, there is a natural tendency to adopt somewhat full figures for the variables which together make up the completed value and/or to adopt somewhat conservative figures for the variables which together make up the development cost. Conversely, from the viewpoint of a valuer who is retained by an intending purchaser and who has therefore a responsibility to ensure that his client does not pay more than the full value of the land, there is a natural tendency to adopt somewhat conservative figures for the variables making up the completed value and/or somewhat full figures for the variables making up the development cost. At this point of divergence between the two valuers, however, the discipline of open market conditions intervenes, imposing external sanctions which are highly effective. The external sanction facing the valuer for the intending vendor is that, if his choice of figures for the variables should throw up too great a difference between completed value and development cost, his client may well fail to find a purchaser at all because the calculated site value is above actual open market value. The external sanction facing the valuer for the intending purchaser is that, if his choice of figures for the variables should throw up too small a difference between completed value and development cost, his client may well fail to buy the land at all because the calculated site value is below actual open market value. It is a striking and unusual feature of a residual valuation that the validity of a site value arrived at by this method is dependent not so much on the accurate estimation of completed value and development cost, as on the achievement of a right balancing difference between these two. The achievement of this balance calls for delicate judgment but in open market conditions the fact that the residual method is (on the evidence) the one commonly or even usually used for the valuation of development sites, shows that it is potentially a precision valuation instrument. If there are two equally proficient valuers acting respectively for a willing vendor and a willing purchaser they would thus expect to agree on a price for the site in question, it being irrelevant for this purpose that one valuer may have arrived at the agreed site value by using figures for completed value and development cost differing substantially from those used by his colleague.

The tribunal then goes on to consider the use of the method in cases such as the one before it where there is to be no market transaction and which in their view presents dangers:

When a residual valuation is prepared for arbitration purposes, however, the conditions are very different; the valuation is then a calculation made *in vacuo*; and although there may be a deemed open market there are no external sanctions acting as an incentive to the achievement of the delicate balance which I have described, because there is in effect a captive purchaser and a captive vendor. Thus there is no risk on the vendor's part of losing a sale by reason of the price advised by his expert being too high, nor is there any risk

on the purchaser's part of missing a buyer because the price advised by his expert is too low. Possibly as a side-effect of this absence of any external constraint, the natural tendency of the vendor's (or claimant's) valuer to adopt full figures when calculating developed value and conservative figures when calculating development cost almost invariably results (in the experience of the tribunal) in his putting forward an undependably high opinion of site value. Similarly the natural tendency of the purchaser's (or authority's) valuer to adopt conservative figures when calculating development cost almost always results in his putting forward an undependably low opinion of site value, and on occasion it may even throw up a minus site value. Having observed on so many occasions the working out of these tendencies in terms of widely conflicting 'valuations' the deep impression on the minds of the tribunal is that under arbitration conditions ... once valuers are let loose upon residual valuations, however honest the valuers and reasoned their arguments, they can prove almost anything. It is against this background and for this reason that the tribunal has reluctantly found itself compelled to reject the residual method when put forward as opinion evidence, unless there is no simpler method of valuation available.

The tribunal then considered the use of two substantial figures – the completed value of the development and the total cost of carrying out the work – to find the surplus available for site purchase and associated costs. The fact that the result is usually a smaller, albeit substantial, amount suggests that it is particularly sensitive to changes in the components used to find the figures first referred to. This observation is a further expression of the strong resistance to the use of the residual method where it is not exposed to the rigour and proof of the marketplace in a subsequent arm's length market transaction.

In the form in which it is normally presented to the tribunal, the residual method for the valuation of a development site shows a site value which is thrown up as the difference figure between the estimated value of a completed development of the subject land, and the estimated cost of carrying out that development. The figures of completed value and development cost are usually both much greater than the difference between them, i.e. they are both much greater than the site value which is being sought. In the make-up of both the completed value and the development cost there are a number of variables; the appropriate figure to be adopted for each of these variables will depend on the viewpoint as well as on the knowledge and experience of the valuer; the choice from which each such figure may be made is a fairly wide one, varying from what may be termed 'conservative' to what may be termed 'full'; and within this range whatever figure may be adopted is 'correct' in the sense that it can be substantiated.

But if we consider the market composed of builders, developers, investors, speculators and others wishing to purchase land on which to erect a building for a particular

purpose, they will quite naturally move towards the value of the site by a deductive process – that is, they will ask themselves the potential value of the completed development, and what the costs are of achieving that development including the return required for the effort, skill and risk involved in the transformation. The deduction of all costs from the value of the completed development will provide a guide to the maximum price they can afford to pay if their criteria are to be met.

It should be noted that the difference when expressed as the ultimate land value represents the maximum bid the developer can afford to make on the basis of the inputs used; other developers may arrive at higher or lower amounts reflecting levels of efficiency, costs of overheads, the individual firm's cost of borrowing or the strength of the developer's desire for that particular piece of land. Thus, strictly speaking, the residual method provides a 'calculation of worth' rather than a market value, as it is specific to the developer. The matter of worth versus market value is important. When developers are considering a bid, they need two points of reference: worth, being what they can afford to pay; and market value, being what they are likely to have to pay.

The unique calculations made by each interested party will result in a range of possible bids. The greater efficiency of a particular developer will ensure a higher residue, although not all of the savings will necessarily be made available for purchase of the site. A developer should be able to make the winning bid without sacrificing the whole of the increment attributable to the company's greater efficiency or other particular circumstances. The developer will wish to consider the likely bids of others and the benefits of purchasing the site. Except in auction situations, it is possible to make an initial offer to establish interest.

As an example, a developer may have calculated a residual of, say, £1 million for an office development site but would be ill-advised to make such an offer until the market price was known; the site may be placed on the market at £850 000 and it may be possible to obtain it for slightly less in the haggling of the market. Conversely, had the asking price been fixed at £1.1 million, a purchase at this price would have eaten into the developer's profits on the basis of the calculations made. Worth and value therefore set the parameters within which to bid, but where worth is less than market value the developer may decide to withdraw from the fray.

However, it would be wrong to conclude that time had been wasted: on the contrary, the exercise has served a purpose in indicating to the prospective developer that this particular site should be avoided unless there is a real prospect either of reducing costs or of intensifying development to increase the value of the completed project. This is one example of the ways in which development proposals are shaped and refined.

WIDESPREAD USE

The method is unique in that it is widely employed not only by valuers but also by developers and builders, i.e. 'the market'. At its simplest, the procedure is little more than a mental calculation, a process that may be acceptable where the site is

a small uncomplicated one for a single unit of development and the calculation is made by someone having wide experience in the particular type of development envisaged and able to relate to a recent transaction involving a similar site.

It would not be prudent to try to assess larger or more complicated sites in the same way, particularly since the method has attracted much criticism due to its lack of sophistication. This need not be so. The robustness of the exercise can be tested statistically in various ways. There is room at least to look at a range of probabilities in rental values, building costs and costs of borrowing.

The next chapter will be devoted to ways in which the method is applied in a range of circumstances.

SUMMARY

- The residual method is used where there is potential for development, redevelopment or refurbishment.
- It enables a site value to be found without direct market evidence of value.
- The method simulates the approach taken by the market.
- Development is a complex activity, dependent upon a wide range of variables, thus making comparison a much less suitable framework for valuation.
- The rationale of the residual is that the investment value of the completed and fully let development, less the total construction and associated costs, leaves a surplus available with which the developer can finance the purchase of the land and the associated fees and costs.
- The input variables need to be well researched and carefully considered so that they do not have a knock-on effect throughout the calculation.
- The basic residual is highly flexible and can be used to determine the developer's maximum land bid, the profitability of a given scheme or indeed the amount of any input variable given a required land bid or profit figure.
- The basic residual can be criticized as being too simplistic in its approach to the timing of costs, including finance charges.
- The criticisms of the basic residual can be alleviated by the application of various cashflow models.

9 The residual method – the process

Having collected as much information as possible, the valuer will make use of it in determining the residual value of the site. (It is worth repeating that the available information may be used to produce other results; for example, the land may already be in the ownership of the developer or the price already fixed; the developer may wish to determine how much is available to spend on construction works or the minimum value of the completed development necessary to justify the payment of a certain land price.)

Figure 9.1 sets out the main variables to be included. Each item is considered in more detail below.

VALUE ON COMPLETION

The first step is to estimate the gross development value, being the capital value of the completed development. The lettable floor area is calculated and multiplied by the unit letting value to find the total rental value. A yield is then identified by the analysis of sale prices of other similar developments and experience of yields

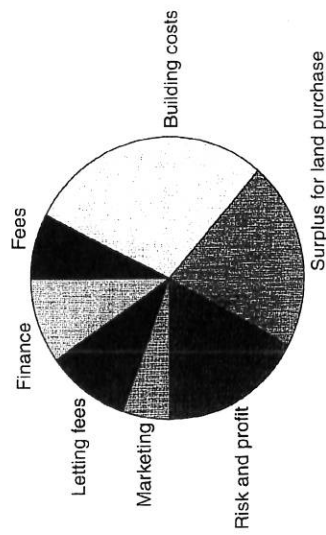


Figure 9.1 Typical constituents of gross value of the completed development

demand by the market in general. This part of the assessment involves the investment method. The end-valuation is normally straightforward, envisaging a rack-rent capitalized in perpetuity for a freehold or, if leasehold, for the length of the ground lease available (a long period, probably 99 years or more probably 125 years unless the ground lease was granted some time ago, in which case the residue of the term will be available). Where the interest is leasehold, the frequency and nature of rent reviews, if any, of the head leasehold interest will be relevant to the yield, as will the effect of any unusual provisions in the lease that fetter the developer's ability to manage and operate the development in the best way. As it is assumed that the development will be sold on completion, the estimated costs of transfer are deducted from the final valuation.

DEVELOPMENT COSTS

In the initial stages of investigation, the developer is considering whether to make a bid for the site. It would not be cost-effective to prepare detailed plans at this stage, so it is likely that the information available to the valuer is provisional and sketchy. The outcome of the calculations will determine whether the site is likely to be of interest. If so, the developer will prepare more details of what is thought appropriate, which will enable the costings to be refined. The main elements of cost are now considered.

Building costs

The valuer should be concerned to earmark a sufficient sum for building costs and contingencies, especially since these have a 'knock-on' effect on other costs (for example, fees and finance). Too generous an allowance, on the other hand, may make the residual amount uncompetitive and result in failure to purchase the site. At this stage a good deal of information, expertise and experience is called for.

Details of building costs will eventually be determined when a contract is signed with the appointed contractor. Meanwhile, information will be gathered from a range of available sources. The developer might provide figures based on its own cost experience. Price books such as Spon's or Laxton's give a wide range of price information; the Building Cost Information Service (BCIS) provides a price subscription service under the auspices of the Royal Institution of Chartered Surveyors (RICS). An edited extract from *Spon's Architects' and Builders' Price Book* is given in Appendix A.

The proposed development will be measured, typically off plan, to reflect the total letting space. It is important for the measurements to conform to the standards laid down in the *RICS Code of Measuring Practice (CMP)*.

The calculations should also include associated items such as demolition, site clearance and preparation where relevant. With an ever-growing emphasis on environment, costs may include the remediation of ground contamination as a prerequisite of planning permission. The valuer may be able to obtain the advice

of a quantity surveyor; alternatively, the development team may have sufficient expertise to advise at this stage.

Professional fees and charges

Professional fees charged by architects, quantity surveyors and engineers might account for 12–15 per cent of the construction cost depending on the complexity of the building. Charges are levied by the local authority for planning applications and building regulation approval.

Site acquisition, the development itself and any sale of the completed scheme will involve fees, charges and expenses. The developer may agree to make a contribution to the professional fees of other parties (for example, as an incentive for prospective tenants) and will be responsible for any arrangement fee in respect of short-term finance. Stamp duty land tax will be payable. Where the developer is registered for VAT the amount paid can be ignored, as it will be recoverable. Charities and certain other groups are in a different position with regard to VAT, and it may be necessary to provide for all or some of the charges. An extended note on the impact on rents of VAT is included in Chapter 5.

The building contract

The building contract may be negotiated subject to a 'rise and fall' clause – the usual method whereby the client is exposed to any future changes in wage rates and material costs occurring after acceptance of the contractor's offer. Alternatively, the costs may be based on a 'fixed-price' contract, which is likely to be at a higher figure to compensate for the risks of future cost increases. In estimating the cost under this approach, the contractor will have regard to the length of the contract, the type of labour required, the ability to reserve materials for later delivery at a fixed price, the state of the company's order book, the general level of activity in the industry and a considered view of the wider economic indicators. Any time overrun is likely to provide grounds for the contractor to lodge an additional claim.

Contingencies

An allowance in the region of 5 per cent of the combined building costs and fees is made to cover the cost of unexpected items. The allowance may be higher where significant areas of cost have not been resolved in the early stages.

Short-term finance

Short-term finance is required to provide working capital to acquire the site, pay for professional services and meet interim and final certificates issued by the architect. The money is borrowed and interest paid for the period of the loan. Three distinct elements require finance: the *land acquisition*, the *construction*

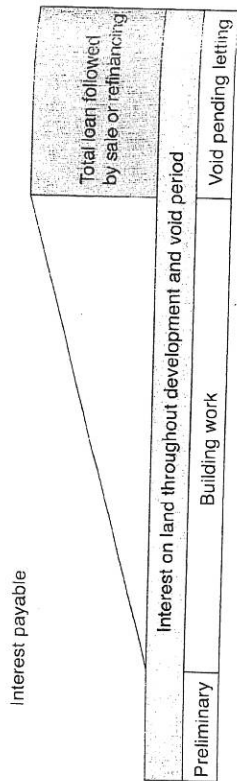


Figure 9.2 Interest incurred during the stages of development (shaded)

(the building costs, professional fees and incidental expenses), and the *void period* (the period following completion of construction until the development is sold or refinanced).

Land acquisition

Borrowing for the land purchase will be a constant part of the total finance package to cover the site purchase, fees and associated preliminary costs. This is shown diagrammatically in Figure 9.2. Where there is a void period, the land element together with the construction costs will need to be financed for an uncertain period beyond physical completion of the works.

Construction

Borrowing for the construction phase will require progressive access to the total loan negotiated to enable payments to be made as costs are incurred.

Where it is possible to predict the rate of expenditure, a more sophisticated cashflow approach can be adopted. Otherwise, an accepted 'rule of thumb' is to calculate the total interest on the build costs and to assume that an average of half that amount will be borrowed over the period.

Void period

Once the development is completed the premises are available for occupation. But there is no certainty that a tenant or tenants will have been found at that stage and it is prudent to allow a void period by the end of which the building will be occupied. Many developments are speculative, in the belief that tenants can be found for the space created. Where possible, the developer will have already agreed sale terms with an institution or other investor to take effect once the development is complete and fully let.

Marketing the development will take place before construction is completed, but it is unlikely that all the space will be let by the time that it is ready for occupation.

Until this point is reached, short-term finance will continue to be required. At this stage, all the costs of land purchase, construction fees and other charges will need to be financed.

Where required, short-term finance is arranged through a bank or similar lender to meet the developer's need to borrow funds. The perception of property development is that of a higher risk activity. However the interest rate negotiated may also reflect the size of the loan, the proportion it bears to the total development cost, the existence of a pre-let or pre-sale and indeed the track record and financial muscle of the developer in question. In assessing a developer's best bid for the land, finance costs should be included in the residual even if a developer is acquiring the land and financing construction out of its own funds, so as to ensure that the opportunity cost of that money is reflected. In the event that there is strong competition for a site that the developer is particularly anxious to develop, the firm may choose to forgo some or all of the expected return on internal funding by adjusting the amount included for this item.

Where an investment fund is sufficiently interested in acquiring the completed development, it may well offer to provide the short-term finance as well.

Advertising and marketing

Advertising and marketing are crucial to the development. Publicity costs can be high and not entirely predictable; where lettings are not taking place as anticipated, it may be necessary to relaunch the marketing campaign and increase the budget by a significant amount. Expenditure may include newspaper, magazine, radio and television advertising, site boards, show building, negotiators on site, printing of brochures and other publicity material, press releases and general launch costs. The Internet provides a new advertising medium offering extensive cover. The allowance is best estimated by costing the proposed campaign and adding a margin; it would be inappropriate to calculate the cost as a percentage of the capital or rental value unless the developer had considerable experience with the particular type of development.

Agency fees

Agency fees will be incurred in the letting of units in the completed development and the investment sale of the tenanted entity. Where joint agents are appointed, the total costs are likely to be higher.

Fees will usually be expressed as a percentage of the estimated rental value used in the gross development value. Investment sale fees represent the purchaser's prospective costs of acquisition, to include an agent, solicitor and stamp duty, with investment sale fees amounting to some 6 per cent of the sale price. The purchaser deducts the sale fees from the gross development value to arrive at the net price to be paid.

Other costs

Other costs may be incurred in compensating outgoing tenants or in winning the consent of occupiers of adjoining property (for example, infringements of rights of light or allowing a crane to traverse the air space). All letting and sales transactions will be liable to stamp duty land tax.

Developer's profit

The developer's profit and risk will be shown as a cost of the development process. The amount charged may be a percentage of the capital value of the completed development or a percentage of the total costs involved, the allowance typically ranging from 10–25 per cent.

The level of profit and risk will be judged on the complexity of the proposal, the volatility of the outcome, the prestige of being associated with the particular development and the extent to which the profitability may be assured (possibly in part by a pre-arranged sale to a fund).

LAND VALUE

The gross amount available for land purchase is found by deducting the gross development costs from the net development value.

The remaining figure, the surplus, includes not only the cost of the site, but also fees, stamp duty land tax and finance charges in acquiring the site and holding it until the development is fully let and income-producing and thus capable of disposal in the investment market.

The net amount after deduction of costs is not a value in the strict sense, merely an indication of the maximum bid the particular developer can afford to offer for the site if the required returns are to be achieved on the basis of the information available.

The following example demonstrates the whole process in relation to a proposed office development. The accompanying commentary attempts a step-by-step explanation of the process.

Example 9.1 Office development: sum available for site purchase

A development company wishes to acquire a site in a provincial city where outline planning permission exists for the erection of an office block with a gross floor area of 1500 m². The accommodation will be on three floors served by two passenger lifts, and there will be surface car parking for 20 vehicles. There is a steady demand for office suites at rents in the region of £300/m². Short-term finance is available at 10 per cent, and the completed development could be sold to show a yield of 6 per cent. Construction costs are likely to be in the region of

£1000/m² over a building period of 12 months. It is anticipated that the whole of the building will be let within three months of completion of building works. Advise the company as to the maximum price it can afford to pay for the land on the basis that a profit of 15 per cent of the gross development value is required.

Gross development value on completion of scheme

Estimated rental value: 1200 square metres @ £300 psm 360 000 **a**
 Years' purchase in perpetuity @ 6% 16.6667 **b**

Gross development value 6 000 000 **c**
 Deduct costs of sale @ 4.5% 270 000 **d**

Net proceeds of sale 5 730 000 **e**

Gross development costs

Building costs: 1500 square metres @ £1000 psm 1 500 000 **f**
 Contingencies @ 5% on building costs 75 000 **g**
 Professional fees @ 15% 236 200 **h**

1 811 250 **i**

Short-term finance @ 9%

Construction costs (average 50%) 78 750 **j**
 Fees (average of 75% for building period) 177 188 **k**
 Total costs over void period (3 months) 40 753 **l**

2 107 941 **m**

Lettings

Agents' fees @ 10% of rents 36 000 **n**
 Marketing campaign 15 000 **o**

2 158 941 **p**

Developer's risk and profit

15% of gross development value 900 000 **q**

3 058 941 **r**

Surplus available for site purchase (gross)

PV £1 1.25 years @ 9% 2 671 059 **r**

0.8979 **s**

2 398 283 **t**

135 752 **u**

£ 2 262 531 **v**

Deduct site acquisition costs @ 6%

Maximum available for site purchase (net)

Commentary

The workings show a basic calculation that will indicate whether a scheme is likely to prove viable, based on the assumptions made. It should be borne in mind that the initial study is very approximate; for example, it will be noted that the planning permission exists only in outline and there is no firm building cost. The valuer will be making many assumptions about the design and quality of the building, which will affect rental values, yield and building costs. The outcome in terms of the value of the land will need to be treated with caution.

The following comments relate to the reference letter alongside each item in the worked example:

- a The rent is arrived at from a consideration of current market comparables but will not be determined until the scheme is complete, so is referred to as an estimated rental value. As offices are measured for letting purposes on a net internal area basis in accordance with the RICS *Code of Measuring Practice*, the given gross area of 1500 m² has been reduced, in this case by 20 per cent, to 1200 m². Detailed plans would allow the net figure to be calculated more accurately.
- b The yield is determined by reference to known comparables of similar new or modern office buildings in comparable locations. As the development site is of freehold tenure it has been valued in perpetuity.
- c The gross development value (GDV) is the best estimate of capital value of the completed development. There is an element of risk in the assessment since the building is not yet available and the market for office accommodation may change before leases are finalized. On the other hand, it makes no provision for any increase in rental value by the date of completion.
- d Sale costs are deducted on the assumption that the development will be sold on completion, once the units are fully let.
- e The net proceeds of sale take account of the purchaser's costs of acquisition.
- f Building costs are assessed as accurately as possible in the light of the information currently available. Useful sources of building cost information are *Spon's Architects' and Builders' Price Book* (see Appendix A) and the BCIS cost index published by the RICS. The cost of construction is based on the gross external area. Where more accurate costings are available from a quantity surveyor or other source, they should be used.
- g Contingencies are unforeseen costs incurred during the period of construction. The allowance depends on the uncertainties in any particular development but typically would be 3–5 per cent on the sum of construction costs and professional fees.
- h Professional fees include expenditure on the services of architect, town planner, quantity surveyor, mechanical and electrical engineers and others where required. A rule of thumb of 15 per cent can be used unless more accurate information is available.
- i The sub-total of the major cost items, being the figure upon which developers will assess their margin if they choose not to base it on the value of the completed development.

- j The developer will incur interest charges on building finance or, where internal funds are used, there will be an opportunity cost as the funds are not then available for use in other activities of the company. Experience suggests that the average amount borrowed over the building period will be one-half of the total estimated building cost, including contingencies. This example assumes that interest would be charged on an annual basis, although it is more likely that the interest would be calculated quarterly. In either case, the cost would be 'rolled up' and the interest paid in one sum from the proceeds of sale at the end of the project.
- k A substantial proportion of professional fees is payable during the early stages of construction, which is reflected in taking an average of 75 per cent of the total estimated costs.
- l In anticipation that the building will not be fully let on completion, finance will be required for a further period, here estimated at three months. At this point, the whole of the building cost will be financed or assumed to be financed. It should be noted that the void finance on the land element is dealt with separately under the heading 'surplus' in the residual. (See note 's' below).
- m A sub-total gives the sum of the construction and finance costs.
- n The building must be let to create a saleable investment. The services of a commercial property agent will incur a fee, usually based on a percentage of the first year's rent together with the payment of disbursements for advertising and the production of particulars or brochures. Commission at a rate of 10 per cent has been allowed.
- o An estimate of the costs of marketing is included.
- p The total cost of the development is now found.
- q The reward to the developer for profit and for assuming the risk of development may be assessed as a proportion of the development value or of the estimated total costs. In this case, 15 per cent of the GDV has been allowed. The provision will vary with the complexity of the development and the desire of the developer to be associated with it.
- r The gross development costs are deducted from the net proceeds of sale to show the surplus available to buy the site, fund the interest charges and pay the acquisition fees. At this stage, the amount includes interest and costs.
- s First, the interest incurred in acquiring the site and holding it until the investment is sold must be deducted, leaving the amount available for site purchase and costs.
- t This then provides the sum after interest has been paid for the whole of the holding period of 15 months.
- u Acquisition costs assessed at 4.5 per cent are calculated.
- v The remaining amount is what is referred to as the residual 'value'. In fact, it is not a value and it is certainly not the market value. Rather it is the maximum bid the developer can afford to make for the land given the assumptions made. These inputs will be unique to that developer and thus the residual can be considered a calculation of worth.

It is interesting to note that the site cost represents some two-fifths of the 'value' of the finished development. This is a useful comparable when looking at other office development opportunities.

The flexibility of the residual method can be demonstrated with reference to further examples that build on the method detailed above.

The first demonstrates the use of the residual to determine the viability of a development where the asking price of the site is available, for example where a developer is already in negotiation with a landowner and a purchase price has been provisionally agreed.

Example 9.2 Office development: profit available when site cost known

The facts are as given in Example 9.1 except that the land is available at the asking price of £2,250,000. The developer wishes to know whether the proposal would show a profit.

Gross development value on completion of scheme

Estimated rental value: 1200 square metres @ £300 psm	360 000	a
Years' purchase in perpetuity @ 6%	16.6667	b
Gross development value	6000 000	c
Deduct costs of sale @ 4.5%	270 000	d
Net proceeds of sale	5 730 000	e

Gross development costs

Building costs: 1500 square metres @ £1000 psm	1 500 000	f
Contingencies @ 5% on building costs	75 000	g
Professional fees @ 15%	236 250	h
	1 811 250	i

Short-term finance @ 9%

Construction costs (average 50%)	78 750	j
Fees (average of 75% for building period)	177 188	k
Total costs over void period (3 months)	40 753	l
	2 107 941	m

Lettings

Agents' fees @ 10% of rents	36 000	n
Marketing campaign	15 000	o
Total cost of development	2 158 941	p

Add price required for site	2 250 000	i
Acquisition charges @ 4.5%	101 250	ii
	2 351 250	
Add short-term interest charges @ 9%	271 266	
Profit available on basis of fixed price for site	2 622 516	4 781 457
	948 543	iii

The previous calculations are adjusted to take account of the additional information.

Commentary

The calculations have been adjusted in particular to take account of the information given regarding the price of the land. The key difference in Example 9.2 is that the developer's profit figure has been omitted and in its place the land cost and associated expenses are included. By so doing the bottom line is no longer the residual land value but the amount available to reimburse the developer for risk and profit.

- Here the known net land cost of £2,250,000 is inserted.
- The acquisition costs of 4.5 per cent are calculated.
- The interest charges on the loan to cover the cost of the land plus the acquisition fees are calculated over the whole of the 15-month development and letting period. Measured as a percentage of GDV it is 15.8%, rather more than specified by the developer in Example 9.1. On paper, the developer will make an additional £48,500 profit.

Both examples may be criticized for the assumptions necessarily made. The residuals both assume that most borrowings are evenly spread throughout the build period and that costs are incurred from day one, neither of which is true in practice.

A cashflow approach would enable the value to be more precise in the timing of cashflows that may have a significant effect on viability, especially where short-term interest rates are high or development periods long.

The next example will demonstrate the traditional residual approach to a warehouse development and then use the information in a more sensitive way in cashflow calculations.

Example 9.3 Warehouse development by traditional residual method

Value a cleared site for a warehouse development for which planning permission exists. You have collected the following information.

The gross floor area is 1000 m²; the building cost is £260/m² and the units are expected to let at £75/m².

It is anticipated that units with a total rental value of £68,250 per annum will be let and occupied immediately on completion of work in 12 months' time and that the remaining units will be let by the end of the next quarter, i.e. in 15 months.

The period selected for demonstration purposes is quarterly over the 15 months or five quarters; a developer monitoring the progress of a scheme would expect a major financial report at least once a month and access to information on the flow of funds on a daily basis. A modern computer program would provide such information routinely; in doing so, some of the risk of development is removed, since there is much more opportunity to review costs and be alerted to problems at an early date.

Example 9.5 Net terminal value approach

Period	Net cashflow (£)	Interest @ 2.5% per quarter	Expenditure to completion (£)
1	71 662	1.1038	79 102
2	84 971	1.07689	91 504
3	75 417	1.05625	79 659
4	86 451	1.0250	88 612
5	27 016	1	27 016
		Total	365 893
		Developer's risk and profit	127 969
		Total	493 862

Leaving £320 872 for site purchase (gross)

Which enables the maximum site bid to be ascertained.

Expenditure in each charging period is debited with the total borrowing charges for the remainder of the development period and to that extent overstates the costs outstanding at any one time. As the example shows, Quarter 5 incurs no interest as it will be paid out of the proceeds of the investment sale. Quarter 4 incurs one quarter's interest at 2.25 per cent per quarter and so on, increasing with each period.

The example is a simple one but benefits from the cashflow technique. Where payments or receipts are irregular, particularly where the development consists of a number of units that may be let or sold at different times, the cashflow approach is the only way in which a reasonably accurate account of the proposal can be presented.

Example 9.6: Discounted cashflow approach

Period (quarters)	Net flow (£)	PV @ 2.5%	PV of cashflow (£)
1	71 662.00	0.9756	71 663
2	84 971.00	0.9518	84 972
3	75 417.00	0.9286	75 418
4	86 451.00	0.9060	86 452
5	27 016.00	0.8839	27 017
	Add risk and profit @ 15%		127 969
		Total	473 491
	Gross development value		853 125
	Current site value (less costs)		379 634

In this case all expenditure is discounted and deducted from a similarly discounted capital value, reflecting the elapsed time before the investment may be realized. The advantage of the period-by-period approach is that it shows the actual indebtedness at the end of each charging period, rather than the discounted cost and is therefore more helpful for budgeting purposes.

The cashflow converts all costs into present day equivalents as they are incurred, allowing the site value to be deduced directly.

CONCLUSION

It should be noted that the flexibility of the residual approach allows it to be adapted to cope with much or little information. It can be used with small-scale development and expanded to cope with much larger phased development taking place over a number of years.

The availability of powerful computers or even hand-held personal calculators enables the value to carry out calculations as shown in the examples given and to track progress against forecasts. Commercial packages are available, but it is essential that they are used in the knowledge of what assumptions are built into the program.

For the student reader, the above alternative approaches may seem difficult to follow at first, but a very helpful way to achieve an understanding of the approaches is to devise a computer spreadsheet and compare the results with one calculated as previously described. Any program will need adaptation to reflect the peculiarities of the case in hand, and a thorough understanding of the workings of the program is required.