The importance of using Investment Appraisal (IA) as both a valuation tool as well as for investment management

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Abstract

With the emergence of more complex institutional structures and investment products in the global property profession, the need to use a reliable software programme is ever more present. The analytical framework of investment and portfolio valuations has become more complicated, expensive and time-consuming. Furthermore, erroneous application has proved to be more costly, with an ever growing number of litigation claims made against the valuation profession. An ability to evaluate a real estate investment acquisition or disposal is therefore becoming a critical area of discussion for the global real estate industry. Cheng et al. (2011) confirmed the importance of a user being able to “...choose the optimal holding period because “when to sell” affects “whether to buy””. Such viewpoints require a robust analysis and an ability for the appraiser to run and re-run various simulations, to consider a range of likely outcomes. Academics have argued and shed light on the fact that current valuation practices that are naively borrowed from financial theory are substandard and underestimate the market observed risk inherent with real estate investment. This paper gives a brief overview of the methodologies behind real estate investment appraisals and then discusses the application of leading valuation software Estate Master Investment Appraisal (or IA) in today’s property investment market. Furthermore, its application not only as a valuation tool but an investment management tool is brought into the analysis.

A basic case study model is linked to this paper as means of demonstrating some of the commentary included (see Appendix 1 – ‘Hypo Tower A’)

Keywords: investment, valuation, property management
Introduction

It goes without too much saying that the global property investment environment has evolved into a much more complex sector – not only with the underlying economic conditions, but also some of the grounded theory. Academic commentary from the study of the UK commercial markets tells us of how the use of the all risks yield (ARY) in valuations was derived during a period when it was valid to assume rents were fixed and there was little rental growth (a direct result of long commercial leases). This debate was somewhat overtaken by events in the early 1990s. It soon became apparent that the conventional approaches of the ARY were inappropriate for unusual cash flows, such as those properties that are over-rented. Whilst many valuers adjusted their practices by adopting ‘slicing’ methods or ‘term & reversion’ methods, which recognizes that the passing rent on over-rented properties can be split into two distinct sections. Firstly, the market rent (or bottom slice) is what similar properties are currently renting for, capitalized at the ARY. The top slice (or overage) is subsequently capitalized at a substantially higher rate to reflect the uncertainty of the property remaining “over-rented” in the long-term perpetual assumptions made during income capitalization. Even though such techniques are still commonly used, critics suggest that cash-flows can easily be double-counted. In addition, since mid-1990s global commercial real estate has seen a shortening of lease lengths (8-10 years) and an increased inclusion of flexible break clauses – the dual effect of greater uncertainty being introduced to the cash flow.

Academics have been criticising UK investment valuation methodologies for years, pointing out its inadequacies and illustrating the superiority of discounted cash flow (DCF) methods (Havard, 2012). Historically in an environment where transaction levels are high the use of the traditional ARY approach was deemed adequate, especially with valuers having an abundance of comparable and yield evidence. Nowadays, the fundamental characteristics of the commercial markets have changed, not only with thinly-traded activity reducing market evidence, but also the institutional structures. Global economic uncertainty has borne out the development of shorter leases and more frequently observed break clauses, with greater flexibility in corporate leases being the new flavour for occupiers. The dual effect of this, is greater uncertainty in the cashflow projections that previously could be assumed on much longer timescale of 20-25 years, or even perpetuity. According to the recent BPF/IPD Annual Lease Review, commercial occupiers have achieved much shorter leases than previously, averaging 6.5 years in London (from 12 years in 2001), and 5.8 years elsewhere in the UK (17.5 years in 2001). At the same time they have managed to incorporate more break clauses (40% in London leases and 54% in the rest of the UK). So what are the implications for investment analysis? There has been a huge increase in risk both in terms of the income stream and capital values. Covenant strength cannot be guaranteed, the long projection of income stream looking 10-15 years into the future, with no interruption, can no longer be made securely. These changing lease structures are much more inline with the global norm and so valuation approaches are likely to shift towards the DCF as a reflection of the changes in lease structures. The points of negotiation on the leases are also very much turned to the tenant’s favour, with FRI leases being questioned. As a consequence, allowances need to be made for running costs in the long term both operational and capital expenditure as it will, at the very least partially, sit
with the landlord’s future obligations. This becomes a critical area of evaluation of interpretation in the analysis as bottom-line profitability and IRR will be directly impacted upon if overlooked at the acquisition stage. In contrast to the UK market, the European and US markets have always been characterised by much shorter leases, frequently with annual changes in income and often with non-recoverable costs; costs which would vary over time. To value these assets therefore needed methods that projected forward the varying income and expenditure patterns. These more complex income streams needed a primary approach that more easily dealt with these characteristics, namely a DCF approach. This would appear to be now where the global valuation profession needs to sit when looking at advising on the acquisition and disposal of investment properties.

The most common alternatives to these conventional approaches have been the development of growth explicit Discounted Cash Flows (DCFs), the underlying mechanisms of which we see in the Estate Master IA software package. Leading academics, such as Baum & Crosby (2008), advocate the use of discounted cash flow techniques because these techniques are flexible and can explicitly take account of their impacts on the risk and income growth. For example, they are able to deal with short leaseholds or properties that are over-rented, both of which capitalization methods outlined earlier were unable to adequately consider. The main arguments in support of the contemporary techniques are:

- Traditional techniques breakdown in the absence of good comparables so that they often include subjective manipulation of information by the valuer.
- Traditional techniques have in the past produced price inefficiencies for example, in the short leasehold market.
- DCF based techniques take a more rational approach to the valuation of the income flow.
- More flexible technique so can deal with short leaseholds and unusual costs and receipts.

The DCF itself is not without criticism. The main complaints refer to the difficulties associated with accurately forecasting future cash flows and the subjective nature of selecting an appropriate equated yield. Advocators of the traditional methods argue that these methods are more objective because the estimation of market values relies purely on comparable transactions. The purpose of a valuation is to predict price. If the market is using irrational methods, so should the valuer. However, even the most ardent supporter of the traditional techniques accepts the need to use DCF derived techniques where there are no good comparables.

Although the case for adopting a DCF approach seems clear, it has its limitations, many of which sit with the user rather than the methodology. According to Harvard (2012), “DCFs can be unstable when not constructed correctly and are sensitive to key assumptions”. Such an observation would promote the use of a standardised valuation platform, such as Estate Master. Estate Master Investment Appraisal or IA benefits from having a standardised DCF module that is constructed and rigorously tested. In a market of uncertainty, standardised
approaches and transparency of analytical frameworks are key. Users of IA are therefore presented with a spreadsheet interface constructed from the input of conventional investment theory, which are then transposed into the DCF framework. In addition, a separate cash flow worksheet is constructed from the users assumptions and comparable data input and this is able to be read and interpreted at the higher level to ensure both the current and future income streams yield the desired returns.

**What is investment value?**
As defined by the Royal Institution of Chartered Surveyors (RICS) investment value (or worth) is:

“The value of a property to a particular investor/owner occupier/class of investors for identified investment or operational objectives.”

That said, this approach to valuation is not a market value assessment but instead a subjective estimate for a client using inputs which are normally unique to that particular party (via the concepts of liability matching).

In very simple terms, one can review all income-producing assets in the same light, by following the steps below:

**Step 1:** \[ \text{Annual Gross Rent} - \text{Annual Operating Costs} = \text{Annual Net Income} \]

**Step 2:** \[ \text{Annual Net Income} \times \text{Year’s Purchase (YP)} = \text{Capital Value} \]

The term ‘Year’s Purchase’ is a specific term used by valuers that represents the present value of the specified currency at X% for n years or in perpetuity. It is calculated as the inverse of the capitalization rate or yield. For instance, a yield of 8% derives a YP multiplier of 12.5 (i.e. \( \frac{100}{8} = 12.5 \)).

The procedural steps are somewhat an oversimplification of the work of a valuer or analyst tasked to value commercial properties or any other property capable of generating an income stream. There is also a requirement for the collection and suitable analysis of comparable rents, comparable yields (if not specified by the investor) as well as a detailed account of operating expenses. The overarching function in the analysis is to examine the lease structure and contractual obligations of both landlord and tenants. The disconnect between the ‘user’ and ‘investment’ markets in commercial real estate as described by Keogh (1994), makes the task of investment analysis somewhat challenging.

Despite the methodologies described above, investors do not typically hold property in perpetuity. Baum and Crosby (2008) point out that investors tend to sell property assets at reversion or rent reviews so they argue that it is valid to build the assumption that the property is sold at such a point into the valuation. This would permit the cash flow projections to be terminated at an appropriate point in time with future cash flows beyond that point in time being replaced by the resale price. So, if the investor assumes a holding period for his/her
investment then the DCF can be shortened by assuming a resale at the capitalisation rate. Estate Master IA’s dual methodologies of income capitalization and DCF will accurately appraise a property’s purchase and disposal values based on the estimated rental income, which can be forecasted up to 40 years.

Academics also advocate making explicit allowance for rental growth expectations through the holding period. This would be handled in the calculation by allowing the rental flow to be increased at each rent review date by the implied rental growth rate. The software allows the user to analyse a range of attributes that would determine the long-term rental income from investment property, including; option renewal probabilities, the inclusion of lease incentives, market rent escalations and income losses via assumed vacancy void periods. The cash flows should then be discounted at the equated yield and the resale value at the end of the holding period should be calculated as the future rental value capitalised in perpetuity at the equated yield. Estate Master IA also allows sensitivity testing on key variables.

The following sections will discuss both Estate Master IA as a valuation tool and subsequently examine its capabilities to aid in a comprehensive range of property management decision making. Firstly we will examine the software valuation capabilities.

**Estate Master IA as a valuation tool**

Amidst much discussion on valuation definitions across a range of studies, many adopt that of the RICS. Baum *et al.* (1996) define it as “the estimate of the most likely selling price”, the assessment of which is the most common objective of the valuer, known as a “market value’. Market value is typically reserved for the anticipated prices that will take place within a marketplace of willing buyers and sellers which is represented by a history of transactional evidence. Market value is therefore no more or less than an opinion of price at a given valuation date. Investment properties however are commonly valued along the lines of an investment value or worth appraisal, the concept of a ‘value’ to an individual investor or potential group of investors, within a defined investment framework, which under the Red Book is defined as “the net benefits and cost of ownership”. A typical example would be the use of the rate of return (or discount rate) specified by the client rather than one determined from the market place. Estate Master IA has many merits as a valuation tool including the standard templates that ensures a standard approach to appraisals within corporations and the wider industry. As with the entire Estate Master property software suite, it comes with an ability for users to link cells and sheets with Microsoft Excel and internal accounting systems

**Uses of property investment analysis**
Below are outlined a number of broad uses to which Estate Master IA can be put:

- It can be used for the assessment of how much an investor should pay for an asset given the particular circumstances of the investor taking into account factors such as: - tax
- target rate of return
- subjective expectations of the future e.g. rental growth, depreciation etc

This will enable the investor to decide how much he or she can afford to pay for a particular investment given their particular circumstances.

- This can be further developed so that a comparison with the asking price can be made. Is the asking price a “good” price? Is the investor getting a bargain?

- A comparison with the market valuation can also be made in order to assess whether there are inefficiencies in the market? Is there any evidence of overpricing or underpricing?

- It can be used to incorporate risk into the investment decision. As we shall see many of the variables in this type of analysis have a significant degree of uncertainty.

- It can be used as the basis for a decision on the acquisition/disposal of investment opportunities. Which investment is likely to produce the highest return? Investors are looking at competing investments and must make a decision between different properties and also between different asset classes. Hence property investment analysis should provide a methodology for making decisions about the prospects and future returns of different investment opportunities.

So what key variables does the software allow us to consider:

Estate Master IA is structured in an easy-to-use, easy-to-interpret format which has a range of industry standard terminology required to complete a comprehensive property investment appraisal. Within the set-up sheets of IA, users are presented with key valuation inputs and asked to nominate these such as discount rates, capitalization rates, void periods, acquisition dates and holding periods. In addition, a distinction is made to the current cap rate and that on disposal (or terminal yield). Some of these key areas will be outlined in brief detail below:

**Holding period**

How long will the property be held in the portfolio? Will it be sold? When? There is often a sale considered after a rent review or lease renewal. Disposal tends to be difficult before review or lease renewal due to uncertainty in the future rent. Investors will be more interested once this uncertainty (risk?) has been reduced. In the US, where DCF analysis is nearly universal, 10 years is often assumed as a holding period. As we have seen this is subject to criticism since there has been no empirical confirmation of this assumption. However, although the property may not be sold after 10 years, it is still valid to assume a notional resale date in order to assess expected holding period return. The choice of holding period can be important since it can have an impact on the final NPV/IRR figure - so it is often worthwhile to consider a number of scenarios.

In the model linked to this paper we assume a 10-year holding period
Terminal capitalization rate (terminal yield)

In principle the calculation of terminal cap rate at resale is straightforward. It basically involves the projected rental value being capitalised at the projected All Risk Yield at the date of resale. The software allows users a straightforward and transparent means of examining the projected rental values by defining annual escalation rates that can be set against market commentary or standard benchmarks, such as the Retail Price Index (RPI) or Consumer Price Index (CPI). How do we forecast the exit yield - this is the term given to the capitalisation rate at resale? Can we use current yields? This seems inappropriate since the building will be 10 years older and will have suffered depreciation and obsolescence. Can we use current yields for buildings which are ten years older? This seems more defensible. However, it involves an implicit assumption that current macro-economic conditions will remain at resale date. This is unlikely. The basic formula for capitalising the estimated rental value at resale date is \( \frac{ERV}{y} \) where \( y \) is the exit yield. A range of terminal cap rates can be calculated in line with the sensitivity assumptions of the user, assumed on the basis of a +/- classification.

Future Rental Income

When considering rental income, one needs to pay attention to two key areas, namely; rental growth and rental depreciation. Forecasting future rental growth can be problematic and is becoming increasingly sophisticated. Due to the high probability of inaccuracy, it is important to be as explicit as possible with any growth assumptions made. Estate Master IA allows users to benchmark rental growth against industry standards, such as CPI or internal forecasts. The added advantage for users is also the ability for teams to cross-check and modify the underlying assumptions of rental growth if needed. The other major issue affecting future rental income is depreciation. Depreciation refers to the decline in value as buildings grow older. This would be more apparent during long periods of low inflation. Hence, with consequent lower levels of rental growth, depreciation will become a more important variable affecting property investment returns. So how do we take depreciation into account in the investment analysis process. One possibility is looking at different levels of rent for buildings of a different age which are in a similar location. In the model linked to this paper we assume a net rental growth of 4.5% p.a.

voids

There is a possibility (probability) that an existing tenant will choose to relocate to new premises at the end of the lease. Or the tenant may choose to exercise a break clause if this is appropriate. In countries where leases tend to be less than 10 years in length, it is likely that the possibility of voids will be an important consideration. A rental void can easily be included in the cash flow. In addition, users are presented with ‘option probability’ inputs which helps assess whether a tenant is likely to continue to occupy the space or break the lease. Although a hypothetical judgment, consideration to passing rent (that of what the tenant currently pays) vs market rent (what the current market is paying) allows users to assess the likelihood of options being taken (or not).
Outgoings
There is a range of outgoings that need to be considered all of which will impact on the DCFs KPIs (NPV/IRR) including that of the cost of acquisition/disposal fees; conveyancing fees and relevant taxes. In addition, there are capital expenditures that are large single payments of expenditure to maintain the property to a modern-day equilivant standard as well as incentives of options (voids, or leasing up costs). The buying and selling of the investment will involve costs - legal, surveyors, and stamp duty. Management fees will vary greatly between different types of properties. They will also depend on the different lease terms. Properties which give the landlord a large degree of responsibility will incur substantial costs to the landlord. When a property become empty, agents fees will be payable so that new tenants can be found. In the model linked to this paper we apply the simplified assumption that all leases are gross (or FRI) and so the liabilities of maintenance and operating expenditure rests with the tenant. A nominal management fee of 2% has been assumed which represents a loss of annual income for the property owner (this is input in the ‘Investment tab’).

Perspectives of property risk
Having described the property investment fundamentals and having shown the inability for conventional approaches to adequately cope with both modern-day lease structures as well as reliable assessments of risk and uncertainty, we now turn to look at the methods of decision making and risk analysis that stem from using Estate Master IA. The traditional framework of assessing risk in a property asset works along the following lines:

- **Tenant/Default Risk** This refers to the situation where the investor receives no or reduced income. This can occur for a number of reasons. Non-payment of rent may occur because the tenant is experiencing financial difficulties. Bankruptcy may mean that the property becomes void and no income is received. Non-compliance with repairing obligations may mean that the landlord has to pay the costs of repairs. The software allows users to plot the tenant mix and assess the impact of a tenant default on the total annual income received. This can be simulated in the tenancy sheet (under ‘Termination and Reletting’ in the Tenancy sheet).

- **Structural Risk** Property is a physical asset which may suffer from construction defects. These may produces abnormally high repair cost or high maintenance cost. Moreover, the landlord may have to pay for significant cost of refurbishment. In extreme circumstances the building may suffer from structural failure. Functional obsolescence may occur when changing technology renders the property unsuitable for the needs of modern occupiers.

- **Legislation** Changes to legislation can have a significant impact on the income producing ability of a property asset. Changes in case law can impose new burdens on landlords or give tenants extra rights. In the UK the government has been considering abolishing privity of contract whereby the original tenant is still liable for rent. It is expected that this will affect the security of income and increase the risk of property as an investment class. The listing of a property or its inclusion in a conservation area will reduce the landlord’s ability to physically change a property and may reduce its income generating ability. A good example of the impact of government legislation is the Inflation
Reduction Act 1972 when the government froze commercial rents at their current levels.

- **Taxation** Property has been subject to numerous different types of taxes in the post war period. The introduction of new taxes or the abolition of existing taxes can have repercussions for property investment performance.

- **Liquidity** Property is a “lumpy” investment and there may be a limited number of potential buyers (particularly for a large development).

**Using Estate Master IA as a management tool**

So far we have been concerned with assessing the market value of property assets. The assessment of market value provides limited information. It is the basis of property performance measurement. It does not give us any indication of whether the property should be acquired or disposed. It does not enable us to provide any information on whether the property should be acquired. Estate Master IA allows a sophisticated range of outputs that allows users to also apply a management aspect to their analyses. The software’s fund management attributes include: the ability to analyse investor returns; decision-making concerning debt leverage (and peak exposure); management fees; as well as the adequacy of examining the ‘health’ of capital balances throughout the desired holding period (including the interest coverage ratios).

The main objective of investment in real estate is to derive adequate returns from its management. Much can be said for property and lease management as it ultimately drives the long-term income revenue from the asset. Academic studies have examined the types and implications of a variety of property management styles and these can be classified into two broad areas; passive management and active management.

Passive management is largely based on a reactive style of management where the owner undertakes little or no positive planning to ensure the maximum performance of his investments. A manager does not seek opportunities to maximise the performance of his investments. Usually properties held are let initially on good covenants where all responsibility for the property (other than disposal) is delegated to the occupier, however active tracking of market performance is limited. The impetus for any reappraisal of individual properties is usually the termination of the lease, the occupier tenant leaving or a third party. The principal advantage of this approach is that actual management is minimised providing the tenant maintains the premises in good order. Reverting to our earlier discussions on how lease structures have shortened perhaps asset managers should reconsider the merits of such an approach. As a case in point, in the UK the 1980s saw the end of extensive passive property investment in its traditional form brought about by the growth of short-termism and the inability of property to compete with the significantly higher returns of equities as an investment medium. At the same time there was also the growing realisation that property was subject to obsolescence and depreciation.
Under active management, the owner takes a pro-active role and constantly seeks ways to improve the performance of the portfolio both at the individual property and portfolio basis. Managers who adopt this approach assume that inefficiencies exist in the market, and with analysis and lease management these inefficiencies can be identified and exploited. This approach exploits the characteristics of the investment and requires intensive management. It includes aspects, such as providing occupiers services at a charge, and refurbishment and redevelopment to coincide with rises in the market. Issues such as commercial lease management strategy and accounting for depreciation also impinge on such management.

So what key variables does the software allow us to consider to assist us in managing our investments?

At a superficial level the software allows users to chart and plot key information regarding the existing tenants of the building and understand the proportion of income generated by different tenants in the case of multi-tenanted properties. In addition, lease expiries and option probabilities can be examined to cast light on the longevity of the current income stream as well as forecast and anticipate the future revenues (by making reference to the full rental value or ERV overtime). Essentially, the user can adopt a series of analyses based around tenant profiling and study the implications if break clauses were to be exercised, or renewal incentives need to be part of the leasing negotiations. A much more detailed and financial management process can be undertaken in a separate part of the software. Estate Master IA has a separate worksheet for the user to examine the investment attributes of the potential acquisition. Within the ‘Investment’ sheet, the user can do the following:

- Interrogate the individual cash flow periods and examine the implications of offering different lease structures to tenants (gross and net); understand the impact of regular maintenance and capital works; as well as forecast performance based on lease replication options.
- Examine the running yields of the cash flow stream on a period-by-period basis to observe the implications of many common property management decisions, such as tenant defaults, optimum levels of rental incentives to offer, payback periods on capital expenditure.
- Cross-examine the interest cover ratios mapped out from the data assumptions placed within the DCF. The interest coverage ratio, also known as times interest earned, is a measure of how well a company can meet its interest-payment obligations. In real estate investment, it is generally considered that a interest cover ratio needs to be maintained above 1.2, essentially meaning there is a 20% ‘capital buffer’ to service the loan, anything under this would cause considerable concern for the firm as well as any institutional lenders. Conversely, if the interest cover ratio was too high, this suggests that the optimum financial management has not been found (an opportunity exists to magnify earnings through leverage or place equity into a similar or more lucrative
opportunity). In the model linked to this paper (in the ‘Investment’ tab) we observe an interest cover ratio of 2.08 from Month 2 onwards. Loan 1 is set at 50% LTV, however if we bring this to an 85% LTV, the model shows a long-term ratio of 1.34 so it does sit more comfortably within the management risk of the property’s cash flow. That said, one will notice that in this instance the IRR on the Investor’s cash flow is also reduced as a result of larger loan expenditure (from 7.92% to 7.45%).

- Model the financial structures of the acquisition and evaluating different loan options (interest only, principal & interest, differing LTV and gearing ratios)

**Analysis of risk in investment appraisals**

In most cases when we are considering modeling risk we assume there are two options, either the decision maker assumes a position of pessimism or optimism. These points represent the two ends of the risk spectrum and indeed we would be able to appreciate that in hindsight we would have found ourselves falling somewhere in between these two extremes. Estate Master IA allows us to integrate the cash flow over the holding period and ask confirmation on critical areas. When examining the cash flow we can perhaps classify the components into different risk classifications.

<table>
<thead>
<tr>
<th>Risk classification</th>
<th>Examples to consider</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>Rent passing</td>
<td>The tenant is contractually bound to pay this as rent. Where there is a good covenant this can be considered as relatively certain.</td>
</tr>
<tr>
<td>Medium risk</td>
<td>Current LTV, capitalization rates, fee expenditure</td>
<td>These are usually evidenced by transactions so we should be able to estimate them with a degree of certainty. However, problems may emerge when there is not sufficient comparables.</td>
</tr>
<tr>
<td>High risk</td>
<td>Growth rates, rental escalation, future incomes and costs (ERVs)</td>
<td>These are the most uncertain and, therefore, risky variables. We can obtain forecasts of what the rates will be. However, it is likely that these forecasts will contain error.</td>
</tr>
</tbody>
</table>
The key issue concerns risk measurement. The most commonly used quantitative measure of risk is volatility - variance around the mean. Probability is a simple way of measuring uncertainty, and probability is used to describe the amount of uncertainty present. As discussed earlier having an appreciation that today’s lease structures are shorter and contain break clause options, an appraisal needs a mechanism whereby the likelihood of the sitting tenant renewing or breaking their lease can be made. Estate Master IA asks the user to make a self-assessment on the likelihood that the current income will continue, or if not, what would be the financial implications. The decision-maker is therefore presented with the ‘most-likely’ outcomes throughout their investment periods and as such can interpret the cashflow in a detailed manner to arrive at a suitable range of actions. Other areas of the software will ask a range of movement around the input variable. So for instance a discount rate of 10% might have a +/- of 1%, requesting the software to evaluate the investment at a discount rate of 9%, 10% and 11%. This process would therefore present the decision-maker with an assessment of volatility in the range of, let’s say, bid values that would be represented across each of these three calculations.

The use of Estate Master IA allows a number of scenario generations to be built up on a sensitivity analysis. Using scenario testing, it is possible to examine the outcomes of the investment decision under different economic circumstances (see ‘Exec Summary’ tab). The Expected Net Present Value technique simply develops this analysis further. A probability is assigned to each scenario. A probability is then assigned to each potential scenario. In this way each scenario is “weighted” and the Expected Net Present Value can be calculated and cross tabulated to a separate user sheet. The basic method is to group the various estimates to suit particular circumstances or scenarios. For example, if a user wanted to test their rental growth assumptions, they are able to use the software to model the below mentioned scenarios:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Rental Growth</th>
<th>NPV</th>
<th>IRR</th>
<th>Probability</th>
<th>Weighted NPV</th>
<th>Expected NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario A</td>
<td>Deteriorating economic conditions</td>
<td>7.50%</td>
<td>£651,206</td>
<td>0.30</td>
<td>£195,362</td>
<td>-£951,206</td>
</tr>
<tr>
<td>Scenario B</td>
<td>No change in the economic environment</td>
<td>4.50%</td>
<td>£ -1,269,961</td>
<td>0.6</td>
<td>-£61,978</td>
<td>-£1,231,983</td>
</tr>
<tr>
<td>Scenario C</td>
<td>Improving economic conditions</td>
<td>2.50%</td>
<td>£ -2,325,962</td>
<td>0.10</td>
<td>-£232,596</td>
<td>-£2,193,366</td>
</tr>
</tbody>
</table>

This is done by returning to the ‘Set-up’ tab and redefining the rental escalation and then reviewing the new NPV and IRR from the ‘Investment’ tab. The advantages of such an approach are that it overcomes the limitations of a sensitivity analysis in that the likelihood that certain combinations of market conditions occur is taken into account; it enables the analyst to examine the impact of different sets of circumstances. It, therefore, encourages explicit assessment of the probability. However, it is important to acknowledge the limitations of this
methodology. Where do the probabilities emerge from? They are often best guesses and have an implicit element of forecasting in them. The vast majority of forecasts are wrong. That said it offers a rationale framework to pass educated judgments on the critical areas of the investment appraisal.

**Concluding remarks**

On the assumption that these and others are applied correctly, Estate Master IA allows us to produce the following results:

1. They force the user to make decisions in a logical and a consistent fashion with as much quantitative and qualitative precision as possible. By having a standardized framework that is easily modified with the specific of the particular income-producing asset, an extensive analysis of bespoke idiosyncrasies can be modeled when required.
2. The formal approach presented by Estate Master IA improves the attitude of the decision maker. The software forces the decision-maker to be much more specific about the investment criteria on which decisions are made. In addition, it offers a consistent approach to the analysis and evaluation of acquisitions and disposals at the portfolio level.
3. Standardised framework and transparency of the software interface better enables for errors to be traced even if in hindsight, thereby improving similar decisions at a later time.

In relation to the model linked to this paper, let’s revisit the suitability for a $7,000,000 purchase of ‘Hypo Tower A’. The investment summary (in the ‘Investment’ tab) shows that we have a negative NPV and a sub 10% IRR which both suggest that an initial bid of $7,000,000 would be positioned too high. However, these outputs are subject to the loan structure we are currently using (a 50% LTV at interest rates of 8% (7.5% + 0.5% pa). The software allows us to assess other managerial decisions via the suitability of financing and reference to the interest ratio. Our sensitivity testing above also allowed the inclusion of a general macroeconomic analysis and found that based on our probability assumptions the purchase is still likely to produce a negative NPV.

The net steps would be to interrogate the void rates and lease management of the existing tenancy schedule which as shown is easy to do in the ‘Tenancy’ tab.

Another useful analytical feature of the software is the blue KPI bar positioned underneath the tab bar. This shows the user the KPIs in relation to the project’s cashflow. In our model we are presented with the following project KPIs:
<table>
<thead>
<tr>
<th>Project KPI</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Initial Yield</td>
<td>10.73%</td>
</tr>
<tr>
<td>Market Yield</td>
<td>12.41%</td>
</tr>
<tr>
<td>IRR</td>
<td>12.74%</td>
</tr>
<tr>
<td>NPV</td>
<td>£1,213,690</td>
</tr>
</tbody>
</table>

From this we can see that the project itself could be a feasible purchase at $7,000,000 if we could alter our financing structure and lease management. The yield gap between the initial yield (i.e. income return from current tenancy schedule) and market yield (reversionary yield that assumes a full let property at open market rates) illustrates there is an opportunity to increase the income return based on a more intensive (and hopefully more successful) leasing strategy, thereby making a positive return from a $7,000,000 acquisition. In the absence of this type of detail and analytical outputs, lucrative investment opportunities may be lost.

When applying the software to real-life investment opportunities, a user will be able to see the merits of a more systematic method to the analysis, allowing a consideration to ‘one-off’ considerations, especially those dealt with under the conditions of uncertainty. Any model used to evaluate investment opportunities should be able to include an expression of the uncertainty and risk associated to variable factors of an investment – which most significantly would include three core elements: rent passing (income) over the holding period; discount rates and the yield (or cap rates). We are all familiar with the purpose of modeling – and that is for us to enable a problem to be studied, analysed and adjusted in order to arrive at the most feasible (most often profitable) solution. It is believed that Estate Master IA offers a comprehensive analytical framework and more importantly recognizes the current theoretical trends in property investment appraisal. Furthermore, specific user requirements can be modeled (via Excel or other spreadsheet interfaces) to reflect the ever complex institutional structures developing within global commercial real estate.
References


Appendix 1: IA case study – Hypo Tower A

You have been asked to appraise an office building for a potential acquisition. The property is currently on sale for $7,000,000. The property was let two years ago on short-term leases and rent reviews recently took place. The tenancy schedule is shown below:

<table>
<thead>
<tr>
<th>Tenant Name</th>
<th>Floor</th>
<th>Suite</th>
<th>Use Code</th>
<th>Lease Type</th>
<th>NLA (SqM) or Units</th>
<th>Unit Type</th>
<th>Current Base Rent Amount</th>
<th>Unit of Input</th>
<th>Start Date</th>
<th>Previous Review</th>
<th>Expiry Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenant A</td>
<td>G</td>
<td>1</td>
<td>COM</td>
<td>Gross</td>
<td>229.93 SqM</td>
<td>SqM</td>
<td>400.00</td>
<td>/ SqM p.a..</td>
<td>1/01/09</td>
<td>1/01/11</td>
<td>30/05/15</td>
</tr>
<tr>
<td>Tenant B</td>
<td>G</td>
<td>2</td>
<td>COM</td>
<td>Gross</td>
<td>625.00 SqM</td>
<td>SqM</td>
<td>350.00</td>
<td>/ SqM p.a..</td>
<td>1/01/09</td>
<td>1/01/11</td>
<td>31/12/19</td>
</tr>
<tr>
<td>Tenant C</td>
<td>1</td>
<td>3</td>
<td>COM</td>
<td>Gross</td>
<td>400.00 SqM</td>
<td>SqM</td>
<td>335.00</td>
<td>/ SqM p.a..</td>
<td>2/01/09</td>
<td>2/01/11</td>
<td>28/02/14</td>
</tr>
<tr>
<td>Tenant D</td>
<td>1</td>
<td>4</td>
<td>COM</td>
<td>Gross</td>
<td>400.00 SqM</td>
<td>SqM</td>
<td>275.00</td>
<td>/ SqM p.a..</td>
<td>3/01/09</td>
<td>3/01/11</td>
<td>15/06/16</td>
</tr>
<tr>
<td>Vacant</td>
<td>1</td>
<td>5</td>
<td>VAC</td>
<td>Gross</td>
<td>380.00 SqM</td>
<td>SqM</td>
<td>340.00</td>
<td>/ SqM p.a..</td>
<td>3/01/09</td>
<td>3/01/11</td>
<td>15/06/16</td>
</tr>
<tr>
<td>Tenant A</td>
<td>B</td>
<td>4</td>
<td>CAR</td>
<td>Gross</td>
<td>4.00 Spaces</td>
<td>Spaces</td>
<td>300.00</td>
<td>/ Unit per Month</td>
<td>1/01/09</td>
<td>1/01/11</td>
<td>31/01/16</td>
</tr>
<tr>
<td>Tenant B</td>
<td>B</td>
<td>2</td>
<td>CAR</td>
<td>Gross</td>
<td>20.00 Spaces</td>
<td>Spaces</td>
<td>280.00</td>
<td>/ Unit per Month</td>
<td>1/01/09</td>
<td>1/01/11</td>
<td>30/06/15</td>
</tr>
<tr>
<td>Tenant C</td>
<td>B</td>
<td>4</td>
<td>CAR</td>
<td>Gross</td>
<td>5.00 Spaces</td>
<td>Spaces</td>
<td>310.00</td>
<td>/ Unit per Month</td>
<td>2/01/09</td>
<td>2/01/11</td>
<td>4/01/14</td>
</tr>
<tr>
<td>Tenant D</td>
<td>B</td>
<td>5</td>
<td>CAR</td>
<td>Gross</td>
<td>4.00 Spaces</td>
<td>Spaces</td>
<td>305.00</td>
<td>/ Unit per Month</td>
<td>3/01/09</td>
<td>3/01/11</td>
<td>31/12/16</td>
</tr>
<tr>
<td>Vacant</td>
<td>B</td>
<td>5</td>
<td>VAC</td>
<td>Gross</td>
<td>4.00 SqM</td>
<td>SqM</td>
<td>310.00</td>
<td>/ SqM p.a..</td>
<td>3/01/09</td>
<td>3/01/11</td>
<td>31/12/16</td>
</tr>
</tbody>
</table>

You have also gathered the following inputs:

- Forecast rental growth is 4.5% pa
- Investors target rate of return is 10%
- Exit yield is 10.5%
- Review fees at 5%
- Management fees at 2%
- Acquisition and sale fees 3%

The attached Estate Master IA shows how a user can input the following information and evaluate the suitability of the asking price of $7,000,000.