Retention rates, re-investment and depreciation in European office markets

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Abstract

The retention rate of a company has an impact on its earnings and dividend growth. Lease structures and performance measurement practice force real estate investment managers to adopt full distribution policies. Does this lead to lower income growth in real estate?

This paper examines several European office markets across which the effective retention rates vary. It then compares depreciation rates across these markets. It is concluded that there is evidence of a relationship between retention and depreciation. Those markets with particularly inflexible lease structures exhibit low retention rates and higher levels of rental value depreciation.

This poses interesting questions concerning the appropriate way to measure property performance across markets exhibiting significantly different retention rates and also raises important issues for global investors.

1. Introduction

International real estate investment is of increasing popularity and importance. Research by Oxford Property Consultants for Morgan Stanley and DeLoitte and Touche (Oxford Property Consultants, 2002) suggests that the gross asset values of European cross-border vehicles has grown from $5bn to $80 bn in the five year period from 1997. This capital is largely US-managed. (In 2001 alone 43% of new cross-border capital flows in Europe were US-based.)

Differences in investment performance characteristics between international real estate markets derive from a variety of economic and institutional drivers, some of which are not well understood. Examples include differences in lease types across international markets and the consequent impact upon income and capital returns.

In this paper an unusual perspective on real estate investment is adopted by applying the concept of the retention rate, used widely in the performance analysis of listed corporates, as a factor which can explain the different levels of performance delivered by European office markets.

It is widely accepted that the level of retained earnings of a quoted corporate will have an impact on its earnings and dividend growth. Re-investment of profits back into the corporation at rates of return which exceed a risk-adjusted target will create value for shareholders; the full distribution of profits might imply that marginal investment cannot be undertaken at value-adding rates of return.

To varying degrees across European office markets property fund managers adopt full (or near full) distribution policies. In the UK, for example, tenants typically take responsibility for maintenance, repairs and other costs. The rent paid and distributed to investors is 'triple net', and typically there is no retention to fund improvements to the property. In theory, this will lead to higher rates of rental value depreciation, defined as a reduction in rental and capital value relative to the market rental and capital value of a similar but new building.

Is this supported by evidence? To examine this, the paper examines several European office markets across which the effective retention rate policy varies (principally due to different lease structures). We then compare depreciation rates across these markets as a direct proxy or driver of rental growth. We make some observations as to the implications this has for property performance and also for performance measurement in an international context.

In sections 2-5 we establish the four basic building blocks for our theoretical analysis. These are dividend discount models; research into property depreciation and property investment; established theories of retention rates and equity investment; and current performance measurement conventions. In section 6 we attempt to establish a theory that connects the performance of office property with the concept of the retention rate. Sections 7 and 8 present the empirical work and results while section 9 presents the conclusions.

2. Dividend discount models, dividend growth and rental value growth

2.1 Dividend discount models

In this section we attempt to highlight a fundamental difference between an equity security and an office building. It does so in the context of the Dividend Discount Model (DDM), the most widely used security valuation tool in equity markets. The DDM calculates the value of an equity security as the present value of future dividends. Since an equity has no finite life, the dividends are assumed to go on into perpetuity. In equation form:

$$\text{Value per share} = \sum_{t=1}^{\infty} \frac{DPS_t}{(1+r)^t}$$

However, this 'general model' is not very practical to use, since the analyst has to estimate dividends over an infinite number of time periods. Nevertheless, the 'generic model' serves as a basis of more user-friendly forms of DDM.

One such user-friendly form is referred to as Gordon's Growth Model. This model assumes that dividends grow at a constant rate forever. It is also known as the 'single-stage' DDM. In equation form:

Value per share = $\frac{DPS_1}{r-g}$

where DPS_1 is the expected dividend per share in one year, r is the shareholders' required rate of return, and g is the constant growth rate in dividends.

There are numerous forms of the Gordon growth model. These other forms recognise that firms do not experience a one-stage growth in dividends throughout their existence. As they pass through their life cycle they may experience a high-growth stage in their initial phase and a lower-growth stage as they - and perhaps the industry of which they are a part - mature. For a comprehensive review of dividend discount models and their application to various sectors of the equity market see Damodaran (1994).

For the purposes of our discussion, the single-stage model will suffice in highlighting the differences between an office building and an equity security.

Recall the sExhibit growth DDM:

$$P = \frac{DPS_1}{r-g}$$

Rearranging:

$$r - g = \frac{DPS_1}{P}$$

This formula states that the dividend yield on a security is equal to the shareholders' required rate of return less the expected growth rate in dividends.

This formula can also be written in the following form:

k = r - g

and rearranging produces:

r = k + g

This simplified Gordon equation provides that the required rate of return for an equity is simply the dividend yield plus the expected growth rate in dividends. It simplistically assumes that the dividends grow at a constant annual growth rate and that they are received annually in arrears. Its application to property is complicated by two factors. One factor is to do with the normalising influence of property leases, while the second is to do with property depreciation.

2.2 A Gordon equation for property

The first simplifying assumption of the Gordon equation is that income is received annually in arrears, with dividends increasing from year to year as company profits improve. This is not strictly appropriate for equities, as dividends are received twice yearly, but the error is very small. For property, the error is more of a problem, as the prevailing lease structure and rent review pattern will dictate the cash flow pattern, which is partly fixed interest (in real or nominal terms depending on the country) and partly equity and is paid on a quarterly basis. For the UK lease structure, Michael Greaves and later Neil Crosby each introduced equations which will resolve the lease structure pattern for a rack rented freehold – see Baum and Crosby (1988). Neil Turner and Matthias Thomas have also undertaken research in relation to the German and UK office markets which demonstrates the significant differences in total return delivery produced by superimposing different lease structures over the same market rent and yield changes (Turner and Thomas, 2001).

3. Dividend growth, rental value growth and depreciation

The second complication, and one which is central to the theme of this paper, is that the DDM requires the estimation of expected dividend growth (g). For equities, the estimation of this expected growth across the market is driven largely by expectations of economic growth, profit generation and profit share. A major apparent complication is the difference between profits (earnings) and dividends, given that the latter is determined by management. However, it is usual and fair to assume that there is a direct relationship between earnings and dividend growth. The difference is explained by the retention rate, that is the expenditure which has been taken out of earnings to reinvent the company. This can be determined as follows:

Dividend payout = Dividends/Net Income

1 - Payout Ratio = Retention Rate

A flat retention rate over time will mean that growth in earnings will translate directly into the same rate of growth in dividends.

Rental growth for buildings is also a function of economic growth. But buildings, unlike equities, suffer from deterioration and obsolescence. As they age, they become less valuable than equivalent new buildings as a result of wear and tear and changes in technology. Depreciation itself is a loss in the existing value of the property. It can be caused either by physical deterioration or by functional or aesthetic obsolescence. While obsolescence is one cause of depreciation, such a decline in utility is not directly related to physical usage or the passage of time. It instead reflects itself in the attractiveness of the exterior, the attractiveness and usefulness of the internal finishes, the attractiveness and usefulness of the services and the adaptability of the space configuration (Baum, 1991).

For property, the estimation of expected rental growth across the market is often undertaken using an index derived from a sample of properties such as the IPD annual index in the UK. This sample is being continuously renewed and replaced by the institutional owners who contribute data and who are themselves renewing and replacing the properties which comprise their portfolios. However, this renewal does not occur because of high retention rates at the individual asset level. It occurs predominantly because old properties are sold to non-contributing (often private) owners, and hence fall out of the index. At the same time new buildings are added as new developments are completed by institutional owners and added to their portfolios of 'standing investments' (Barras and Clark (1996)). A central tenet of this paper is to recognise that the renewal of the stock does not come about by high retention rates at the individual asset level.

Meanwhile the 'standing investment' portfolio is suffering depreciation. In the market index, the calculated and reported market rental value growth is gross (at least in part) of any retention which is necessary to correct depreciation and maintain the competitive position of the individual assets which make up the index. This is likely to be expressed as expenditure being undertaken on refurbishment works.

This fundamental difference has led Baum (1997) to argue that the Gordon equation should be adjusted for property to take account of this fact. Market rental growth, g, is reduced by a factor of d, so that the delivered return is also reduced by that amount:

$r = k + g - d$

Net rental growth in property portfolios $(g - d)$ is therefore a different concept from earnings and dividend growth for equities (g).

4. Return on equity, retention rates and equity investment

To understand why rental growth in a property portfolio or index is different from earnings and dividend growth in an equities portfolio we need to understand what drives growth in dividends in finance literature.

In this literature, growth in dividends is a function of two variables. The first is 'return on equity' and the second is 'earnings retention'. In equation form:

g = (ROE)(b)

where ROE is the return on equity enjoyed by the firm's investment projects and b is the earnings retention rate adopted by the firm.

To understand ROE properly it is necessary to understand how a firm's various balance sheet and income statement items influence earnings. The financial analyst community usually takes advantage of DuPont decomposition analysis to understand how each major component of the business affects the ROE of a firm (see Damodaran (1994) for a full discussion on DuPont ratio analysis). For our purposes it is sufficient to point out that the ROE is driven by the firm's ability to utilise its operating profit margin, asset base, financial leverage and fiscal position to take advantage of the prevailing business cycle. ROE is simply the product of the interaction between the firm's balance sheet, income statement and cash flows and the current economic environment.

However, this ROE is augmented by the retention rate a firm employs (1 minus the payout ratio). During periods of prolonged economic expansion, where there are abundant positive Net Present Value (NPV) projects, a company will tend to increase its retention rate and increase the ROE, which will have a positive effect on dividend growth. Indeed during the late 1990s economic expansion one US economist commented that:

> *" … if companies are well managed and if they are generating good returns on assets and equity, they should be reinvesting their money back into their business rather than paying dividends, which is exactly what these companies are doing. Payout ratios in the United States are at their lowest levels in decades. For the S&P 500, the payout ratio is now 36 percent, compared with the normal range of 50-75 percent. And return on equity, at 20 percent, is at its highest level" (Cohen, 1997).*

The firm's decision to retain earnings is obviously crucial to the future growth in dividends. Either way the firm has complete autonomy to decide where it sits within the taxonomy of high earnings retention, high dividend growth and low dividend yields since it controls its own dividend policy. (Portfolio managers, in formulating investment strategies for their funds, may also find the retention policy of the company a useful indicator of company type (growth or value) in style investing.)

5. Performance measurement conventions

Performance measurement organisations in the UK and US typically use total return measures for single year performance measurement for all assets. The simple formula is as follows.

$TR = [Y^{0-1} + CV^{1} - CV^{0}]/CV^{0}$

Property causes particular problems rooted in its unique nature as a physical asset class. Capital expenditure will be necessary from time to time to repair, refurbish, extend and improve property. How should this be dealt with? There are two alternatives. Capital expenditure can either be thought of as a revenue item, causing a reduction in net income, or as a capital item, creating an increase in capital invested.

5.1 Capital expenditure as a revenue item

Strict comparability with equities would suggest that minor capital improvements (CI) should be financed out of cashflow, just as a company would use cashflow or retained earnings to maintain its capital assets. The appropriate treatment is then quite simple. The income return is reduced by the expenditure while the capital return may be increased if the expenditure adds value to CV^{1}.

$TR = [Y^{0-1} - CI) + (CV^{1} - CV^{0)}]/CV^{0}$

5.2 Capital expenditure as a capital item

However, it can be argued that capital improvements are not always minor, and that major improvements - say, extending a building - are similar to purchasing new assets. The appropriate treatment would then be to say that the amount of capital expended adds to CV^0 (and to CV^1 as long as the expenditure adds value) but does not affect the income return.

$$TR = [(Y^{0-1)} + (CV^1 - (CV^{0+} CI))]/[CV^0 + CI]$$

Both IPD in Europe and NCREIF in the US currently use variations of this formula. However, arguments have been made in favour of adopting the first measure (treating capital expenditure as a revenue item). Examples include Young, Geltner, McIntosh and Poutasse, 1995, in which it is suggested that the effect of performance measurement conventions can be significant. While the total return is unlikely to be much affected by the choice of measure used, treating capital expenditure as a revenue item can cause the income return to fall (and the capital return to rise) by as much as 2% in typical cases. Given the increasing attractiveness of property as a low risk, high income liability match both for institutional investors and those using debt to finance purchases, it would be surprising were there to be an appetite in the investor community for making this change.

The adoption of the capital item concept, on the other hand, maintains income returns. We suggest that this may not be optimal to long term total return, because it exaggerates the true income return of a property and further inhibits the owner's freedom to reinvest. This may in turn inhibit rental and capital growth, and total return. This possibility is explored in the following section.

6. The investment performance of office property, depreciation and the retention rate

It seems reasonable to suggest that the retention rate of an office property, similarly to the equity securities discussed in section 4 above, will be essential to the rate of rental growth enjoyed by that asset. If a firm were not constantly reinventing itself by retaining earnings and reinvesting, the prospect for dividend growth would be reduced. Why should it be any different for property? In this section we explore property research results which begin (indirectly) to address this concept.

6.1 The problems of retaining income in office properties

Several academics (see, for example, Grenadier, 1995) have recently used option pricing theory to explain the nature of property as an asset. This work suggests that property ownership and control present abundant opportunities for positive NPV projects which owners of property rights might wish to take advantage of. For example, the particular sub-market where the property is located may be subject to supply shortages and high levels of tenant demand which would present opportunities to the owner to extend or improve the accommodation and thereby generate positive NPV projects within the building. In many instances, however, the owner is restricted from undertaking such projects because the lease governing the investment will prevent him from doing so. Formally, the office investor has lost control of the retention rate and payout ratio.

In the UK, where there are many properties let to single tenants on long triple net leases, the situation is extreme. In this market, positive NPV projects will often be unavailable to owners. Owners will often be unable to alter the retention rate of the investment and must endure high payout ratios even though they know they could or should be reinvesting cash flow in positive NPV projects.

This establishes a fundamental difference between an equity security and an office property. Recall that the firm has flexibility to decide where it wishes to place itself within the taxonomy of high earnings retention, high dividend growth and low dividend yields since it has complete control over retention rates and dividend policy. The owner of an office building does not enjoy this freedom, as he is at the mercy of the prevailing lease structure governing the investment. This is crucial to an understanding of depreciation in property investment and the performance characteristics of the asset class.

6.2 Depreciation research in the UK

Salway (1986), Baum (1991 and 1997) and Barras and Clark (1996) have undertaken the four major pieces of research in the UK concerning estimated annual depreciation rates for office property. Dixon et al (1999) undertook a full and comparative review of these previous depreciation studies.

The Salway study used a cross-sectional approach to estimate rates of depreciation based on agents' views of rental values and yields for hypothetical buildings of different ages at a given point in time.

Baum (1991) undertook a similar study but of 125 real office buildings in the City of London and 125 industrial buildings in a prominent industrial area of the UK, and added a longitudinal analysis to a cross sectional study.

Barras and Clark (1996) examined rates of depreciation in the City of London office market. They used IPD data which was analysed both cross-sectionally and longitudinally, to explore the relative performance of different age bands of City office buildings, and to calculate rates of depreciation measured in terms of rental and capital values. The Barras and Clark study had various working hypotheses, but two are more relevant to this research than the others.

> *"As they age, individual buildings will command a decreasing share of the top rent in their market … This means that the rate of rental growth for individual buildings will fall short of the market rate of growth by a margin equivalent to their rate of depreciation." (ibid, p66).*

> *"Taking a whole population or a portfolio of properties together, it will show a cross-sectional profile of decreasing rental and capital values with increasing age." (ibid, p66).*

To test the hypotheses, Barras and Clark undertook a longitudinal study, comparing the performance of those City offices which remained continuously in the IPD portfolio throughout the 1981-1993 period with the whole City portfolio acting as the surrogate market portfolio.

The results supported the earlier findings of Salway (1986) and Baum (1991). They each found a shortfall between the rates of ERV [estimated (market) rental value] growth of the continuous sample compared with the surrogate market population which equated to average annual rates of depreciation of 1.2%. There is remarkable consistency between the three studies in terms of ERV average annual depreciation estimates – Barras and Clark, Baum and Salway estimate 1.2%, 1.3% and 1.4% respectively.

Baum (1997) up-dated his 1986 work and suggested that in a low inflation economy, depreciation is now much more important as a driver of property investment performance than it was in the 1970s and 1980s. Yet its effects continue to be poorly understood. Even the central London office market, arguably the best-researched sector of one of the world's most efficient property markets, offers the potential for serious depreciation-linked mispricing.

6.3 Active and passive management

Patel (2000) investigated the investment performance of single-let office properties relative to multi-let offices for the Central London office market. He found that the multi-lets (actively managed, with shorter leases) had outperformed the single-lets over the 18-year period of analysis. The reason for the out-performance was due to consistently stronger rental growth experienced by mutli-let office properties which did not appear to have been factored into the pricing of such assets. Conventional wisdom would, of course, suggest that the returns should be higher for such properties, but most would expect this to be delivered through higher income returns to reflect the perceived risk profile of such assets when compared to their single let counterparts.

One possible explanation of this finding is to the effect that the active management sample enjoyed higher re-investment of income and lower retention rates, resulting in higher rental growth, as multi-let properties enjoy greater re-investment opportunities. This is related to lease structures. Multi-lets are often characterised by shorter leases and a lack of co-terminous terms between contracts. This presents owners with much greater opportunity to retain and reinvest income than a owner of a building governed by a 25-year single-let triple net lease.

6.4 Is the UK a special case?

Section 6.2 and 6.3 report the results of UK research. Arguably, the UK has the highest average lease lengths in global office markets and therefore suffers the lowest retention rate relative to other countries. Given very long triple net leases which discourage (even prevent) owners from retaining income to reinvest in their buildings, we would expect to find low retention rates associated with UK property relative to other European markets.

The retention rate for property is inextricably linked to lease structures. All else the same, those markets that have long, net leases will discourage/prevent owners from retaining income to reinvest.

Remember:

$r = k + g - d$

The authors suggest that the adjustment for depreciation (d) is different in each country and is a function of retention rates and lease structure. The more inflexibility introduced to the retention of income by the prevailing lease structure, the greater adjustment required to the standard Gordon equation to account for depreciation. In other words, the greater the difficulties incurred by owners in injecting money back into their buildings, the greater the drag on rental growth and the larger the adjustment to rental growth (g) required.

In Sections 7 and 8 below we develop and test our hypotheses more formally.

7. Hypotheses and empirical tests

7.1 Hypotheses

On the basis of the theory outlined above, two working hypotheses were tested through an empirical study undertaken.

Hypothesis one is as follows:

> *There are differences in the levels of revenue and capital expenditure incurred in office portfolios in London and other major European cities. London will experience statistically significant lower levels of recurring expenditure than the other cities.*

Hypothesis two is as follows:

> *There are differences in the rate of office ERV depreciation between London and the other European office markets. Higher levels of expenditure identified in some markets will offset some of the debilitating effects of depreciation. In European cities outside London, we will observe lower rates of ERV depreciation, which be smaller in those markets which are subject to shorter, non triple net leases and consequently higher retention rates.*

7.2 Hypothesis one: empirical test

> *There are differences in the levels of revenue and capital expenditure incurred in office portfolios in London and other major European cities. London will experience statistically significant lower levels of recurring expenditure than the other cities.*

In order to test this first hypothesis we determined the average annual amount of expenditure being reinvested by owners in their standing office investment portfolios across five cities in Europe – namely, the Central London Office Market, Paris, Stockholm, Frankfurt and Amsterdam. For London we undertook the exercise separately for single tenant and multi-let properties in order to further Patel’s research and investigate whether the mutli-let sample enjoyed higher retention rates than the single-let sample. The aim was to arrive at an annualised value of appropriate revenue and capital expenditure which was being incurred by owners in order to maintain the occupancy levels and competitive position of their office portfolios. Since the conventions for recording revenue and capital costs vary between national markets, and the fields established in IPD’s national databases reflect these differences, specific cost categories were chosen for each country in consultation with IPD. A complete list of the categories can be found in appendix one.

In order to maximise the number of observations and reduce the prospect of skewed data due to extreme expenditure in any one year, it was decided to undertake this analysis over a three-year period (1998 to 2000) on a consistent cohort of properties. The data was collected and analysed by IPD and provided to the authors in summary format.

The computational procedures are relatively straightforward. The average annual expenditure was calculated as the arithmetic average for each city sample over the three-year period by aggregating the cost items which appear in appendix one. This annual reserve was then expressed as a percentage of the opening market value of each cohort at start 1998.

The sample sizes for each city are as follows; London single-let (383 buildings), London multi-let (385), Frankfurt (66), Paris (155), Stockholm (154) and Amsterdam (94).

7.3 Hypothesis two: empirical test

There are differences in the rate of office ERV depreciation between London and the other European office markets. Higher levels of expenditure identified in some markets will offset some of the debilitating effects of depreciation. In European cities outside London, we will observe lower rates of ERV depreciation, which be smaller in those markets which are subject to shorter, non triple net leases and consequently higher retention rates.

As with other earlier depreciation studies, a cross-sectional approach was adopted. The year that provided the authors with the largest sample sizes was 1999.

Firstly, following previous depreciation studies, we excluded any property which had an age of construction prior to 1960 from the analysis on the basis that older buildings are fully depreciated (see Baum, 1997) and any analysis would be skewed by the age of these properties. A further refinement to the data set was to re-gauge the construction dates of properties which have undergone 'major refurbishment'. An adjustment is made for these by assigning their age as the date of the last major refurbishment (defined as a refurbishment costing more than 25% of the total capital value of the property at the time the works were undertaken).

After these adjustments to the data were made, the sample sizes of each city were as follows; London single-let (186), London multi-let (205), Frankfurt (73), Paris (150), Stockholm (215) and Amsterdam (100).

The data sets were then segmented into age groups, 0-4 years, 5-9 years, 10-19 years, 20-29 years and 30-39 years. Previous studies examining office rental value depreciation have adopted similar age bands as a basis for study. The (un-weighted) arithmetic average rental value, derived from the year-end valuation of each individual asset, was then computed for each segmented age-band. The rate of depreciation was then calculated as a geometric mean using the difference between the mean for each age-band and reflecting the number of years within and between age-bands. This approach was employed by the CALUS study (1986), Baum (1991) and for the cross-sectional element of the Barras and Clark (1996) study.

Two further points should be made here. Firstly, the authors have, in effect, measured cumulative depreciation. The properties were grouped by age band and the youngest group, age 0-4, was used as the benchmark for the next oldest group, age 5-9, and so on. It is important to understand, therefore, that this research has captured the rate of depreciation relative to the younger group of properties rather than the market as a whole.

The second issue to be highlighted is the computation of the rate of depreciation. The geometric mean is used to calculate the rate of change between two rental points. The calculation used is:

$R_n = R_o (1-d)^{n-o}$

where:

R_n = rental value of building n years of age

R_n = rental value of building o years of age

d = annual rate of depreciation in rental value

In the example below, which is for the sample of London single-let properties, the index of rental value calculated by the authors was 100 for the age band 0-4, 73 for the age band 5-9, 75 for the age band 10-19, 71 for the age band 20-29 and 45.5 for the age band 30-39. Therefore, in order to calculate the rate of depreciation over the first five years and so on, these rental values are inserted into the above equation.

where:

R_n = rental value of building 30-39 years old

R_o = rental value of building 0-4 years old

re-arranging for d:

$R_n = R_o\ (1\text{-}d)^{n-o}$

becomes:

$$1 - \left\{ n - o \sqrt{\left(\frac{Rn}{Ro} \right)} \right\} = d$$

$$1 - \left\{ 32.5 \sqrt{\left(\frac{100}{45.5} \right)} \right\} = 2.45\%$$

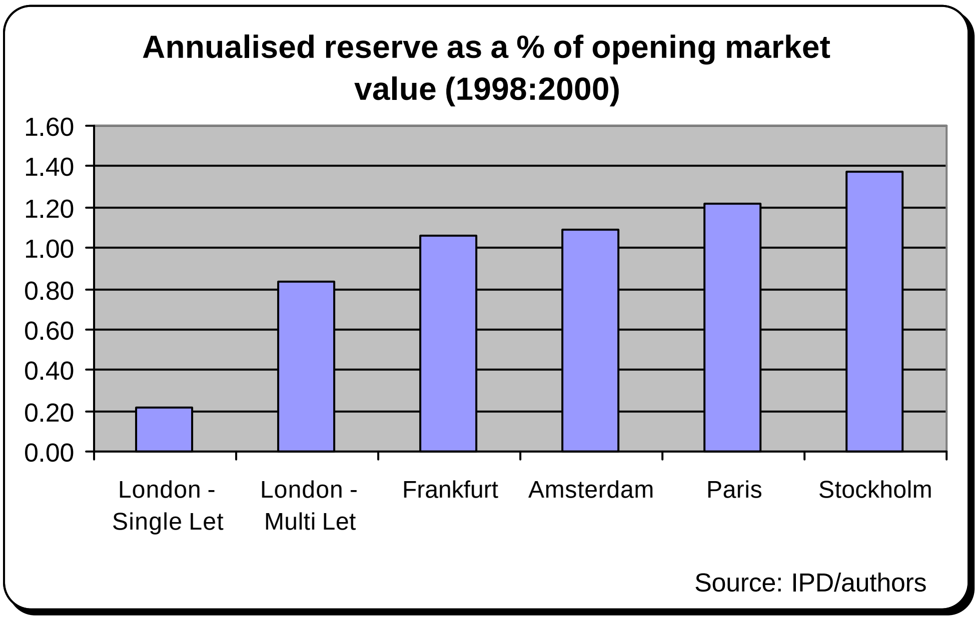
and we can compute the 2.45% estimated for the London single-let sample which represents the estimated rate of depreciation for the sample over the 32.5 years between the 0-4 age band and the 30-39 year age band. The print-out from the spreadsheet is included as appendix 2 for the London single-lets. This process was repeated for each of the other European cities in order to estimate annual rates of rental value decline. The results are presented below.

8. Results

8.1 Hypothesis one

We found strong evidence to support the theory that there are significant differences in the annual retention rates incurred in standing investment office portfolios across European markets (see Exhibit 1). The first, striking, observation is that all of the Continental European office portfolios appear to exhibit much higher retention rates than do the London samples. For example, there are only 31 basis points of difference between Stockholm and Frankfurt, the highest and lowest average retention rates on the Continent respectively. London single lets are, by contrast, more than 100 basis points lower than Stockholm and some 84 basis points below Frankfurt. This is consistent with the theory that the shorter, gross leases would allow for greater retention rates for office portfolios on the Continent.

Exhibit 1: Retention rates



Another interesting finding is the large difference between the two London samples. The multi-let retention rate is approximately four times higher than the single let sample (see Exhibit 2). Again, this would be expected given the differences in lease structure normally found between these two types of office building.

Exhibit 2: Retention rates

City	Retention Rate (% of capital value)
London Single-let	0.22
London Multi-let	0.83
Frankfurt	1.06
Amsterdam	1.09
Paris	1.22
Stockholm	1.37

Having established that these differences existed between the mean retention rates, the authors were interested to determine whether there was any statistical significance that could be attached to the findings. Exhibit 3 includes the summary t-statistic for testing whether the population mean retention rates between each city are likely to be statistically different from one another given the sample means, sample size and standard deviations. In order to be confident that the differences in sample means had not arisen due to chance, the t-statistic should be in excess of 2 at the 95% level of significance.

Exhibit 3: Differences in retention rates: significance

	Paris	Amsterdam	Frankfurt	London (S)	London (M)

Stockholm	0.83	1.51	1.38	12.39	3.03
Paris		0.61	0.62	9.41	2.11
Amsterdam			0.12	8.25	1.17
Frankfurt				6.62	0.87
London (S)					5.55

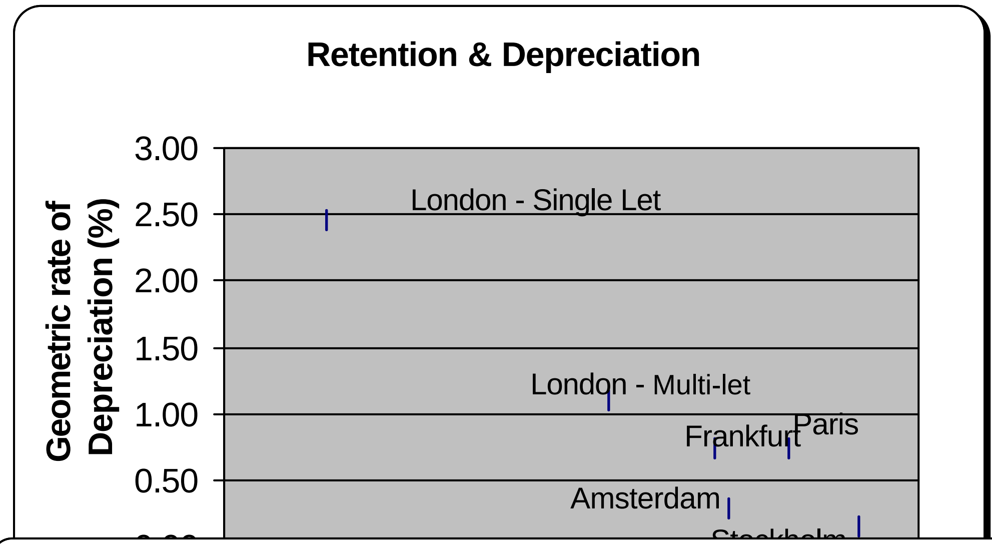
Encouragingly, the lower London retention rates observed in this study appear to be very significantly different from all of the other European cities observed in the research. Further, the low single-let retention rate is not just significantly different from all of the other cites, but is also different from the London multi-let.

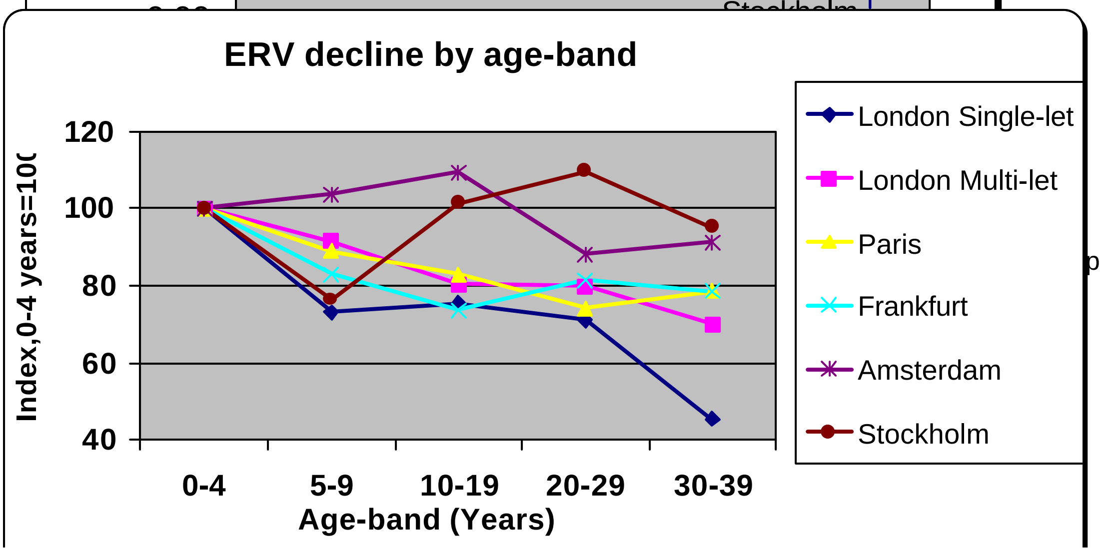
Stockholm is tentatively different to Amsterdam and Frankfurt (a significant result at the 90% level). Once again this would appear consistent given the very short lease structure prevalent in the Swedish office market facilitating higher retention rates.

8.2 Hypothesis Two

The findings to support the second working hypothesis are also encouraging. As expected, the London single-let property sample displays both the highest rate of rental value decline by age and the lowest retention rate of all cities. Stockholm, by contrast has both the highest retention rate and lowest rate of rental value decline.

Exhibit 4: Retention and depreciation rates compared





p of rental

Exhibit 6 shows the UK single-let and multi-let samples average rates of ERV depreciation of 2.45% and 1.10% respectively. These average rates of rental value decline are not out of line with the previous UK studies discussed above. The fact that the single-let sample experienced a rate of rental value depreciation of over double the rate of depreciation for the mutli-let sample is noteworthy. Recall that the retention rate on the multi-let sample was almost four times that of the single-let sample. Perhaps we are witnessing the benefit of higher retention in the form of lower depreciation rates and higher rental value growth, a finding which Patel (2000) inferred.

The Paris and Frankfurt office markets experience higher retention rates than the UK sample and, once again, we find lower rates of rental value depreciation.

The Amsterdam and Stockholm samples exhibited retention rates of over 1% - both significantly higher than the UK single-let sample. They also experienced the lowest rates of rental value depreciation. Indeed the rental value profile by age band for the two cities looks very different to the other cities. This may be to do with the supply and demand dynamics of these two markets in particular at the end of 1999, as both markets were fundamentally under-supplied with demand driving rents ever higher for older stock. This phenomenon could also have been more to do with the availability of older stock relative to newer stock owing to the lack of new construction in the previous three years. Equally, there may be a significant inverse relationship between retention and depreciation rates.

Exhibit 6: Retention and depreciation rates

City	Retention Rate (%)	Depreciation (%)
London Single-let	0.22	2.45
London Multi-let	0.83	1.10
Frankfurt	1.06	0.74
Amsterdam	1.09	0.28
Paris	1.22	0.74
Stockholm	1.37	0.15

8.3 Limitations

The methodology chosen for this research was predominantly a cross-sectional approach. This was mainly due to the absence of an accurate and accessible dataset in order to undertake a longitudinal study. The cross-sectional approach, however, is not without problems. The impact of sudden obsolescence due to technological change may be missed because of the study date selected (Dixon et al, 1999) or a market imbalance may distort annual patterns of depreciation. This indeed may be the case for Amsterdam and Stockholm. A further problem with the cross section approach is that the validity of the results is reduced as depreciation is not tested over time (Baum, 1997). However, the three-year cohort of properties used to compute the level of retention rates does not suffer the same limitations as the straightforward cross-sectional approach.

9. Summary

In this paper we have argued that property investment differs from investment in securities, and equities in particular, due to its physical nature and the consequent depreciation it suffers. This means that the rate of income growth which the asset class can deliver is constrained, and that constant growth models used for the analysis of property need to be adjusted to reflect this fact.

Performance measurement systems which allow comparisons of income, capital and total return within asset classes and also across asset classes have become standard. It is rarely argued that the design of these systems can be questioned, but in the case of property investment it appears that the same depreciation phenomenon can be disguised by assuming a full distribution of income when the maintenance of capital value might require a retention to be made. The effect is to support income return, and in an era of low inflation this might place severe pressure on capital returns, and the possibility of excessively confident expectations regarding total return.

We also discussed the link made in securities analysis between retention rates and total returns. Higher returns on equity might be achieved by re-investment rather than through a full distribution policy.

We are not in a position to prove that full income distribution damages returns in property markets. However, we can suggest that in some markets a full distribution policy is necessitated by common leasing convention; and that this might lead to higher depreciation rates than in those markets where leasing practice allows owners to actively manage their assets more easily. To test this, we measured and compared retention rates across European office markets, and found interesting differences. We compared those retention rates with depreciation rates, and found a clear inverse relationship.

This paper's contribution, therefore, is to take forward Baum's earlier work which argued for the standard Gordon equation to be adjusted when applied to property by reducing g by d as follows:

$r = k + g - d$

Through theory and empirical work, we have presented the first evidence to suggest that the adjustment made for d in the above equation will differ across national office markets. Further, we also argue that the different adjustments are necessary to reflect dissimilar retention rates between markets which are themselves a function of the diverse lease structures found across those office markets.

This suggests, of course, that owners may choose to achieve greater re-investment rates than they are able to do under local leasing conventions. It also suggests that some re-investment of income is believed to be necessary to maximise returns, and more importantly that re-investment does relieve depreciation and thereby improve net income growth.

This in turn may or may not increase total returns. Work is now needed to relate retention rates to total returns. We may then observe a relationship between retention, depreciation and return. We may also begin to challenge the common understanding of the split of total property return between capital and income.

Income returns are computed after deducting various costs incurred during the year. However, if these costs are different between international office markets (due to differences in lease structures) is the income return comparison valid across markets? Is an income return for a UK office building really comparable to an income return for a US, German or French office building or is it overstated? If income returns on UK office property are overstated relative to other office markets, this is not insignificant. The relative high income return on property is consistently used as an argument to hold property relative to other lower yielding asset classes. In this regard perhaps the asset class is enjoying misleading publicity in some countries.

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Appendix One

London – UK Databank definitions

1) property management costs
2) other non-recoverable revenue expenditures
3) capital expenditure on improvements – to be disaggregated by type of expenditure

Amsterdam – ROZ/IPD Netherlands Databank definitions

1) management costs
2) maintenance costs
3) fitting out costs
4) letting and marketing costs
5) non-recoverable service charges
6) capital expenditure on improvements

Frankfurt – DID/IPD Germany Databank definitions

1) management costs
2) maintenance costs
3) letting & marketing costs
4) capital expenditure on improvements
5) capital expenditure on improvements – provisions made

Stockholm – SFI/IPD Sweden Databank definitions

1) planned maintenance
2) fitting out costs
3) property administration
4) capital expenditure on improvements

France – IPD France Databank

1) management costs
2) marketing and letting costs
3) maintenance costs
4) fitting out costs
5) non-recoverable revenue costs due to vacancy
6) capital expenditure on improvements

Appendix Two

Summary data-sheet – London single-let sample				
Age band	**Average ERV**	**count**	**Band**	**Index**
0-4	283	27	2	100
5-9	207	34	7	73
10-19	213	66	14.5	75
20-29	201	30	24.5	71
30-39	126	29	34.5	45.5
		186	**32.5**	