IPF Research Programme 2006-2009

Depreciation of commercial investment property in the UK

Research Report

November 2011

This research was commissioned by the IPF Research Programme 2006–2009

IPF Investment Property Forum

This research was funded and commissioned through the IPF Research Programme 2006–2009.

This programme supports the IPF's wider goals of enhancing the knowledge, understanding and efficiency of property as an investment class. The initiative provides the UK property investment market with the ability to deliver substantial, objective and high quality analysis on a structured basis. It will enable the whole industry to engage with other financial markets, the wider business community and government on a range of complementary issues.

The programme is funded by a cross-section of 24 businesses, representing key market participants. The IPF gratefully acknowledges the support of the contributing organisations.

Addleshaw Goddard

British Land

Credit Suisse

Deloitte.

DLA Piper

DTZ

GIC Real Estate

Grosvenor

GVA

Hammerson

Helical Bar plc

IPD

Kenmore property group

Knight Frank

Land Securities

LaSalle Investment Management

Legal & General

Aviva Investors

Nabarro Clarity Matters

PRUPIM

Quintain

Standard Life Investments

Strutt & Parker

Scottish Widows Investment Partnership

Research Report

IPF Research Programme 2006–2009

November 2011

Research Team

Neil Crosby, *School of Real Estate & Planning, University of Reading*

Steven Devaney, *University of Aberdeen Business School*

Steering Group

Asli Ball, *GIC*

Gerry Blundell, *Advisor, L&G Property*

Mark Callender, *Schroders*

Rob Martin, *LGIM*

Alan Patterson, *AXA IM*

Pam Craddock, *IPF*

Acknowledgements

The research team wishes to thank IPD and CBRE for the provision of data needed for this research. They also wish to thank the IPF Project Steering Group for their advice and comments.

CONTENTS

EXECUTIVE SUMMARY

This report updates selected analyses from the 2005 IPF study, Depreciation in Commercial Property Markets (IPF, 2005). In particular, it focuses on rates of rental depreciation and capital expenditure, measuring these over the period 1993–2009. As with the previous study, data has been provided by Investment Property Databank and CB Richard Ellis for this purpose. The analysis concentrates on a sample of 742 buildings that were continuously held over the period and the principal findings are as follows:

- At a sector level, offices experienced the highest rate of rental depreciation, at 0.8% p.a., followed by industrials at 0.5% p.a. and standard retails at 0.3% p.a. This relative ranking is consistent with previous studies.
- Sector-level rates conceal considerable variation in segment-level results. Regional office and industrial assets showed greater depreciation than their counterparts located in London and the South East. However, in the case of standard retail, the opposite was found.
- In general, the standard retail results are harder to explain than the other findings, with high depreciation found for assets in Central London, but appreciation found for the 'Rest of UK' area. These results raise questions about methodology and the stability of depreciation rates over time.
- Shopping centres retained in institutional ownership showed very little depreciation, at 0.1% p.a., but the segment had a high capital expenditure rate relative to other segments. This is also consistent with previous research.
- Offices received more capital expenditure as a proportion of value (0.5% p.a.) than standard retail or industrial assets, but the distribution of individual rates is highly skewed, with many assets receiving no capital expenditure over the period studied.
- There is considerable dispersion in property-level depreciation rates, reflecting the fact that individual property investments are highly heterogeneous.

In the concluding section, the report recommends that a number of issues be investigated further. These relate to the method of analysis and the data. The method (cross-sectional or longitudinal) involves a trade-off between time scale of the analysis and sample size. Other issues include the impact of location, especially on retail, different segmentation of the data including type, lease structures, age and size, the shape of depreciation through time, prime and secondary properties, the state of the market and the treatment of capital expenditure.

1. INTRODUCTION

Depreciation is an important issue for property investors since it affects both the returns from and pricing of real estate assets. Causes of depreciation include physical deterioration and various forms of obsolescence, the latter arising as technological, social or regulatory changes in the economy take place. Such changes typically mean that older buildings become uncompetitive relative to assets that have been built more recently and more in line with current user requirements. Thus, rental values and rental growth prospects for older assets are likely to decline, with consequent impacts on capital values and total returns. Declines in either condition or functionality also trigger requirements for expenditure by property investors, not all of which may be recoverable from tenants in the buildings concerned. This expenditure has further consequences for property portfolio performance.

Recognition of the impact of depreciation has generated requirements for information on the rates of depreciation and expenditure affecting different property types. Such information can be used to inform macro-level analyses of the role and likely returns from property investment in a multi-asset context. It can also be used in micro-level pricing models to evaluate whether specific assets should be bought or sold and it has relevance in a lending context where appraisals may need to project the value of a building at the end of the life of a loan. Finally, such information may guide decisions as to the appropriate time to refurbish or redevelop an asset. Nonetheless, it should be stressed that the applicability of past depreciation and expenditure rates to the future period being modelled in such cases must always be considered.

In light of the importance of depreciation as an issue for property investors, the Investment Property Forum sponsored a research project on this topic in 2005. A team from the University of Reading and Investment Property Databank sought to establish an appropriate framework for the measurement of depreciation and to apply that framework to data on individual assets within the IPD UK database. The project also used data on the rents and yields of hypothetical new assets supplied by CB Richard Ellis. The key outputs were rates of rental and capital depreciation, plus rates of capital expenditure, for the periods 1984–2003 and 1993–2003, disaggregated by the IPD Portfolio Analysis Service (PAS) segments. These outputs were published in the report **Depreciation in Commercial Property Markets** (IPF, 2005).

The aim of this report is to update the principal analyses from the 2005 study by extending the 1993–2003 dataset that was constructed for that research. Its specific objectives are to measure the rates of rental depreciation experienced in different segments of the UK commercial property market over the period 1993–2009 and to measure rates of non-recoverable capital expenditure over that same period. The present report does not update the rates of capital depreciation owing to the numerous issues of interpretation raised in the 2005 study regarding these figures. However, the potential for a further study of issues relating to rental and capital depreciation, together with building expenditure, is raised in the concluding discussion. The report also gives more information on the distribution of depreciation rates within the samples studied.

The remainder of the report is structured as follows. A summary of the methods is given in section 2 together with a description of the dataset available for this update report. Section 3 then discusses the results, including a comparison of the new rates with those found in the previous IPF study. In section 4, more detail is given with regard to the depreciation and expenditure rates experienced by individual assets. Finally, section 5 concludes by discussing issues raised by the findings and potential areas for further research which may form the basis of a second phase to this research.

2. METHODOLOGY

The approach taken in this report is the same as that taken in IPF (2005), namely a longitudinal study in which depreciation is measured as the relative decline in value of a group of assets over time in relation to a chosen benchmark. Whilst this section provides details on how the depreciation and expenditure rates have been measured, readers are referred to IPF (2005) for a fuller discussion of the reasons for selecting this approach. This section has been split into two subsections: part one sets out the methods and formulae used whilst part two describes the dataset.

2.1 Measurement methods

Depreciation can be broadly conceived as the decline in value of an asset over time. In the case of commercial properties, absolute declines in rental or capital value may not occur for considerable periods, but, nonetheless, such assets may still experience a loss in value relative to newer buildings that are being developed and released onto the market. Therefore, it is important to understand this decline so that appropriate forecasts for future asset performance are made and the property priced accordingly. In this research, depreciation is defined and measured as: 'the rate of decline in rental value of an asset (or group of assets) over time relative to the asset (or group of assets) valued as new with contemporary specification' (Law, 2004).

The above definition raises issues regarding the availability of appropriate benchmark values, which are returned to below. In addition to requiring a benchmark, a decision must be made about dataset design. A longitudinal approach is preferred to a cross-sectional approach because the former allows the experiences of different types and cohorts of buildings to be studied over a common time frame, whereas cross-sectional studies have to calibrate depreciation in relation to age and at a single point in time. However, with longitudinal datasets there is a trade-off between sample size and the length of time that can be examined.

A formula that enables measurement of relative decline in value for an individual property within a longitudinal setting was advocated by Law (2004) and subsequently adopted by IPF (2005). In simple terms, it expresses the change in asset rental value between two points in time as a ratio and then divides that figure by a similar ratio capturing the change in the value of a benchmark between the same two time points, the benchmark representing a new asset in the same location. The resulting number is then adjusted for the length of the period involved so that the output is expressed as an annualised rate. This formula is as follows:

Formula 1: Calculating depreciation for an individual property

$$d = 1 - \left(\frac{R^{a}_{t2} / R^{a}_{t1}}{R^{b}_{t2} / R^{b}_{t1}} \right)^{1/(t2-t1)}$$

where d = the annual rate of depreciation, R^{a} = asset rental value, R^{b} = benchmark rental value, t1 = start of the measurement period and t2 = end of the measurement period.

The depreciation rates for different properties can then be averaged to arrive at a typical value of depreciation for a portfolio or market segment. However, it may be preferable to weight the results to reflect that different assets command different values within a portfolio and, thus, have varying levels of influence on overall portfolio performance. This makes the measurement of depreciation more consistent with portfolio performance measurement and the construction of property market indices. Value-weighting is achieved here by summing the asset and the

benchmark values prior to computing ratios and this can be done across the whole dataset or for selected sub-samples. Hence, the formula used to generate segment depreciation rates in this report is as follows:

Formula 2: Computing segment level depreciation rates

$$d = 1 - \left(\frac{\sum R^{a}_{t2} / \sum R^{a}_{t1}}{\sum R^{b}_{t2} / \sum R^{b}_{t1}} \right)^{1/(t2-t1)}$$

In theory, an ideal set of benchmarks for this exercise would be measures of the value of new assets in identical locations to the properties being researched. This would allow asset depreciation to be isolated from wider patterns of locational change. In the absence of ideal benchmarks, IPF (2005) reviewed available market indicators for the UK and selected the dataset underlying the CB Richard Ellis **Rent and Yield Monitor** as the best alternative. This was due to its coverage and its hypothetical basis, with observations reflecting judgements about the rent or yield achievable on new or recently refurbished buildings in the prime area for the locations being monitored (for further details, see CB Richard Ellis, 2007).

For this study, CB Richard Ellis again provided the underlying data from the **Rent and Yield Monitor** to assist with analysis. For a given sector (Retail, Office or Industrial), this meant that at least one rent series for each major centre relevant to that sector was available, as well as a large number of series for Central London corresponding to different districts or streets of relevance to either the office or retail market. Retail Warehouse benchmarks up to 2006 were also provided, but after this date there is a major discontinuity, with rents no longer estimated for towns, but for a smaller number of specific retail warehouse parks. Thus, depreciation rates for the Retail Warehouse sector were measured only to the end of 2006. Meanwhile, there are no specific series for Shopping Centres, so rental values in this segment were benchmarked using the relevant shop series for that location, in common with IPF (2005).

The other major element of calculation in this research relates to capital expenditure. In IPF (2005), expenditure rates were measured for individual properties by summing capital expenditure over the period concerned and dividing this by the sum of a set of annual capital values for that asset in that period. Thus, if expenditure was monitored from January 1994 through to December 2009, it would be divided using capital values observed each December end from 1993 to 2008, these representing capital invested at the start of each year. This procedure generates an average annual expenditure rate and it can be extended to produce segment level results by summing the relevant amounts and values across all properties in a segment.

The same approach was used again here, but it is acknowledged that this is not necessarily the most intuitive approach and so an alternative measure was tested. This divided capital expenditure over the study period by the capital value from the start of the period (i.e. the capital value recorded in December 1993). This figure was then further divided in each case by the number of years to give an alternative annual rate. These rates are presented at a segment level in Table 3.2 alongside those from the primary method of calculation. In general, it may be noted that the measurement of long-term capital expenditure rates has received little attention and forms one of the recommendations at the end of this report concerning future investigations[1].

[1] The treatment of expenditure as either capital or revenue related may also be an issue. Both this report and the earlier IPF reports rely on how amounts have been reported to IPD under their standard guidelines.

2. METHODOLOGY

2.2 Research dataset

The dataset used to estimate updated rates of depreciation and expenditure for the UK commercial property market is an extension of the 10-year dataset constructed by IPD for the 2005 IPF study. It comprises information on the rental values, capital values and amounts of capital expenditure for a sample of continuously held properties over the period 1993–2009. It also contains descriptive data such as the location and floor space of each property and, in most cases, the date of construction or last major refurbishment. The focus on buildings that have been held within a single ownership is a constraint that is, in part, driven by the structure of the IPD databases, which do not track properties across institutional ownerships when they are traded.

A number of filters and checks were applied to the dataset prior to conducting analysis. For instance, any buildings that were entirely redeveloped during the period were excluded, as were assets that lacked a full set of data to end 2009 or a suitable benchmark for the depreciation formula. As similar checks were performed for the 2005 study, the number of exclusions on these grounds was small, generally reflecting any changes from 2003 onwards. Meanwhile, some asset records were adjusted to reflect the fact that part purchase or part sale of the properties concerned had occurred. In these cases, values and amounts of expenditure were grossed up to represent an entire asset in the years where they were only part owned.

Table 2.1: Number and value of properties in the sample

	No. of properties	Capital value end-1993 £m	% of IPF (2005) sample[1]	% of assets in IPD at 1993[1]
Standard Retail	319	1,033	37%	5%
Office	217	1,496	39%	5%
Industrial	158	762	47%	7%
Std Ret – South East	185	549	43%	6%
Std Ret – Rest of UK	134	484	32%	4%
Shopping Centre	19	411	26%	6%
Retail Warehouse	29	249	54%	5%
Office – City	41	334	55%	8%
Office – West End	64	402	38%	6%
Office – Rest of SE	75	522	37%	4%
Office – Rest of UK	37	237	33%	3%
Industrial – SE	104	556	50%	8%
Industrial – Rest of UK	54	206	44%	6%
Total sample	742	3,950	40%	5%

[1] Measured in terms of number of assets. Proportions are typically higher when measured in terms of value.

The number and value of properties used in the analysis, disaggregated by PAS segment, is shown in Table 2.1. In absolute terms, sample sizes are fairly healthy within most market segments. However, the sample is somewhat diminished in comparison with that available for the 10-year period 1993–2003 used in IPF (2005) (column 4). Overall, only 40% of the dataset from the previous IPF UK study could be extended to 2009, the main reason being trading activity in the intervening period. Trading has particularly affected sample sizes in the Shopping Centres segment, as well as Standard Retail and Office properties in the Rest of UK area. Finally, sample size in relation to all assets in the IPD databank in 1993 is around 5% overall (column 5).

2. METHODOLOGY

Each of the properties was matched to an appropriate rent point from the CB Richard Ellis dataset. In the vast majority of cases, this was the same rent point used to benchmark that property in the 2005 study. However, for a small number of locations in Central London, the areas monitored had altered, requiring that a different benchmark be selected for the update. The benchmark rents in every case were specified in per square foot terms and so these figures were multiplied by the floorspace of the corresponding property in the sample. This ensured that the properties could be weighted more accurately in the calculations when producing segment rates.

Nonetheless, one issue does arise when seeking to combine the data to estimate an All Property rate of depreciation. Benchmark rents for retail locations are specified In Terms of Zone A (ITZA), whereas the floorspace recorded by IPD is on a Net Internal Area (NIA) basis. As areas ITZA will be smaller than the corresponding NIA for each asset, this causes the estimated benchmark rent to be overstated. Whilst this does not appear to distort the measurement of retail rates, it does distort the influence of retail when combined with data for other assets, as retail is then over-weighted in the denominator of formula 2. Therefore, the All Property rate of depreciation presented in Table 3.1 has been estimated by weighting the PAS segment rates by the relative value of each segment in the IPD index as at the end of 1993.

3. RESULTS – SEGMENTS

This section presents the results from applying the measurement formulae set out in section 2 to the research dataset. In section 3.1, rates of rental depreciation for the period 1993–2009 are discussed and this is followed, in section 3.2, by discussion of capital expenditure rates measured for the same period. In section 3.3, results from this exercise are then compared and reconciled with those given in IPF (2005) for the period 1993–2003. All the rates in this section are aggregate figures, with the experiences of individual properties considered further in section 4.

3.1 Rental depreciation

Table 3.1 presents rates of rental depreciation for the main segments of the UK commercial property market over the 16-year period 1993–2009 on a per annum basis. It also shows the rental growth produced by the sample of assets (column 4) and the matching set of benchmarks (column 3) in each case. Both the rental growth figures and depreciation rates are value-weighted.[2]

Table 3.1: Rental depreciation by market segment, 1993–2009

Sector	No. of properties	Benchmarks – rental growth p.a.	Sample – rental growth p.a.	Rate of rental depreciation p.a.[1]
Standard Retail	319	3.2%	2.9%	0.3%
Office	217	3.4%	2.5%	0.8%
Industrial	158	2.4%	1.9%	0.5%
Std Ret – C London	47	6.9%	5.1%	1.7%
Std Ret – Rest of SE	138	3.2%	2.4%	0.8%
Std Ret – Rest of UK	134	1.8%	2.5%	-0.7%
Shopping Centre	19	2.7%	2.6%	0.1%
Retail Warehouse[2]	29	7.7%	6.7%	0.9%
Office – City	41	2.2%	1.7%	0.5%
Office – West End	64	5.6%	4.5%	1.1%
Office – Rest of SE	75	2.8%	2.0%	0.8%
Office – Rest of UK	37	3.0%	1.1%	1.8%
Industrial – SE	104	2.4%	2.0%	0.3%
Industrial – Rest of UK	54	2.4%	1.4%	1.0%
All Property[3]	-	-	-	0.6%

[1] A negative figure denotes appreciation, i.e. the rental values of the assets have grown faster than those of the benchmark hypothetical buildings.
[2] Retail Warehouse depreciation has been measured over the period 1993–2006.
[3] See discussion in section 2.2 for how this is estimated.

The pattern at the three sector levels is unsurprising and is consistent not only with the results in IPF (2005), but also those of other depreciation studies that have considered more than one sector (eg CEM, 1999). Office buildings exhibit the most depreciation over time and Standard Retail properties show the least, with Industrial between the two. However, the sector-level rates mask considerable variation at a segment level, particularly in the case of Standard Retail. To explore this group of assets further, the data was segmented into three regional groups, with Central London separated from the standard PAS South East group because of the much stronger rental growth here and the distinctive depreciation rate it produces.

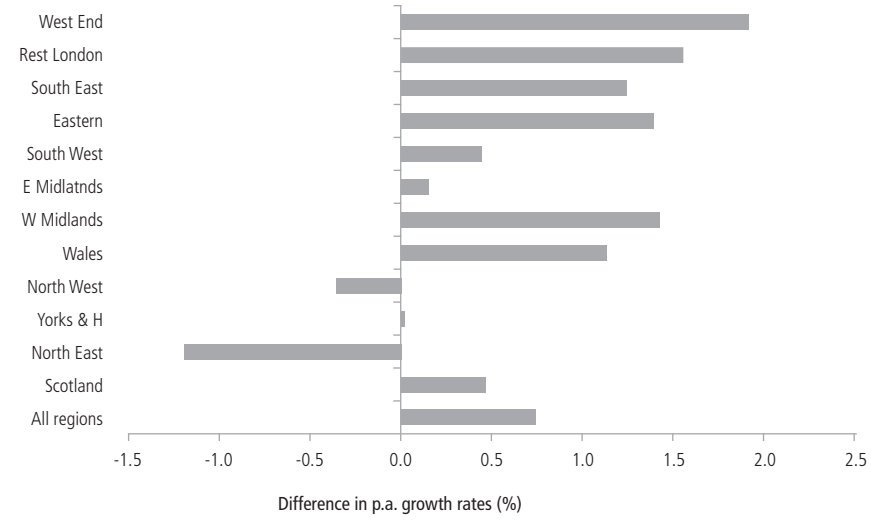
There is no clear explanation for the marked regional variation in Standard Retail depreciation that is suggested by these results. It might be expected that shops would show little rental depreciation, although it is plausible that

[2] The depreciation rates are not exactly equal to the difference or ratio between the rental growth rates owing to the fact that depreciation is calculated on a decline rate basis (see formulae 1 and 2).

the development of new retail schemes in some areas could lead other retail assets to depreciate if they cannot be similarly upgraded. Yet why this should especially affect locations across London and the South East, and not in the Rest of UK, is puzzling. Furthermore, it is difficult to explain the large appreciation rate (-0.7%) found for the Rest of UK group. If the ideal benchmarks, noted in section 2, were available, then appreciation would be highly unlikely. In using data from the **Rent and Yield Monitor,** though, some micro-location factors, arising from differences in location between the sample buildings and the rent points, can come through into the results. This is likely to be more critical in the case of shops, where rents are highly sensitive to location, than for the other sectors. Hence, appreciation rates are possible, although it was expected that these effects would cancel out over large samples.

It is also possible that the samples of shops that have been held over this long period are unusual. To check this, regional rental growth rates for standard shops calculated using the whole IPD database were compared with the growth of regional prime rent series from the **Rent and Yield Monitor.**[3] The difference in growth rates between these sets of series over the analysis period is displayed in Figure 3.1. Similar patterns to those seen in Table 3.1 are apparent. The prime rent indices have grown faster in the London, South East and Eastern areas that comprise the South East in the PAS segmentation. Meanwhile, the pattern in other regions of the UK is more mixed, with the IPD asset-based series showing stronger growth for the North West and North East regions, and very similar growth for Yorkshire and Humberside. This is mirrored in the sample dataset, with shops in cities such as Leeds, York, Manchester and Newcastle typically recording appreciation rates.

Figure 3.1: Standard shop rental growth – CBRE prime minus IPD series, 1993–2009



It is clear that the issues surrounding the depreciation of retail property are not yet fully understood, particularly as most emphasis in the depreciation studies to date has been on office buildings. In this study, the benchmark matching process has attempted to isolate asset depreciation from locational change, but a further study could usefully consider the way that retail values change in response to, for example, new developments and in relation to movements in the prime pitch over time, as well as any issues surrounding the functionality and deterioration of the assets themselves.

[3] Note that the segmentations in these publications are not identical. The Central London and the Suburban London series in the **Rent and Yield Monitor** have been compared with the West End and the Rest of London series, respectively, from the IPD data.

3. RESULTS – SEGMENTS

Turning to the other results in Table 3.1, the sample of Shopping Centres has suffered almost no rental depreciation over the period. This is consistent with the findings in IPF (2005) and suggests that, where Shopping Centres have been retained by their owners, these are in locations where they continue to be the benchmark asset. The lack of depreciation must also be seen in the light of a relatively high rate of capital expenditure for this segment, as shown in Table 3.2. In contrast, despite strong rental growth, Retail Warehouses experienced moderately high rental depreciation, again consistent with IPF (2005). Essentially, this sample of assets represents a fairly early generation of retail warehouses that have then had to compete in an environment where there has been rapid evolution of this format. Given this, the result is not surprising.

For the Office and Industrial sectors, there is regional variation in the results. However, in this case, the patterns are more consistent. The highest rental depreciation in each sector occurs in the Rest of UK area, whilst lower depreciation is found in London and the South East. This is plausible if, in the latter case, occupiers are paying a larger premium for the location relative to the characteristics of the building. Certainly, in terms of capital values, land values typically comprise a greater proportion of total asset value in London and the South East, indicating the importance of including a regional dimension to depreciation analysis. On the other hand, the low rental depreciation rate for the City of London office market and the relativity between this and the West End rate are harder to explain, a point that is returned to in section 3.3.

3.2 Capital expenditure

The rates of depreciation discussed above only give a partial picture of the impact of depreciation on commercial real estate performance. This is because they are measured using buildings on which the owners have also spent money in order to maintain and improve those assets over time. Thus, it was argued by IPF (2005) that these rates reflect 'managed depreciation', as they show the relative fall in rental value for buildings where spending has absorbed at least some of the depreciation impact. The true cost of depreciation to an investor will include this expenditure.

Therefore, as discussed in section 2, two measures of the capital expenditure incurred by owners over time have been estimated. The first of these replicates that used in IPF (2005), dividing the total amount of expenditure in the period by the sum of the valuations recorded at the start of each year. This is shown in column 3 of Table 3.2. The second calculates a rate of expenditure in relation to the initial capital value at the start of the measurement period. This measure is shown in column 4. In either case, it should be recalled that capital expenditure recorded by IPD relates to non-recoverable spending by the building owner and excludes any costs of maintenance or enhancement that could be recovered from tenants in the property. This means that the rates are likely to understate the full cost of maintaining property investments over time.

Table 3.2: Capital expenditure by market segment, 1993–2009

Sector	No. of properties	% of capital invested p.a.	% of initial capital value p.a.
Standard Retail	319	0.3%	0.4%
Office	217	0.5%	0.6%
Industrial	158	0.2%	0.3%
Std Ret – C London	47	0.2%	0.3%
Std Ret – Rest of SE	138	0.3%	0.3%
Std Ret – Rest of UK	134	0.4%	0.5%
Shopping Centre	19	0.9%	1.4%
Retail Warehouse[1]	29	1.5%	3.4%
Office – City	41	0.2%	0.3%
Office – West End	64	0.5%	0.7%
Office – Rest of SE	75	0.7%	0.9%
Office – Rest of UK	37	0.5%	0.6%
Industrial – SE	104	0.2%	0.3%
Industrial – Rest of UK	54	0.3%	0.3%

At the sector level, Table 3.2 indicates that office buildings had the highest rates of capital expenditure and industrial buildings the lowest rates in this period, although the differences between the sectors is not very large. Meanwhile, there is much less variation at a segment level than in the case of the depreciation rates. Shopping Centres and Retail Warehouses stand out as cases where their owners have spent higher proportions of value in order to try and arrest depreciation, with apparently more success in the first case than in the second. The other result of note is once again that for the City of London Office segment. Here, the low rate of expenditure coupled with the fairly low depreciation rate found earlier suggests that there may be something particularly unusual about the assets held for long periods in this market, an issue also raised in the international investigation of depreciation by IPF (2010).[4]

In general, the rates shown in column 4 are higher than in column 3 because expenditure towards the end of the period was not mitigated in this calculation by the rise in property values since 1993. Despite the different approach, the relativities across the sectors and segments largely remain the same. However, the expenditure rates for the Shopping Centre and Retail Warehouse segments are more pronounced. In part, this is explained by the fact that, with fewer assets in these samples, the capital expenditure amounts are much less evenly distributed through time. This is certainly the case in the Retail Warehouse segment where some large amounts of expenditure occur towards the very end of the analysis period.

3.3 Comparison with IPF (2005)

Thus far, a number of similarities with results in the original IPF depreciation study have been noted. In this section, an explicit comparison with these results is now provided. Tables 3.3 and 3.4 report the rental depreciation and capital expenditure rates, respectively, from both the original study and this update. In addition, as these studies have examined different time horizons, the current sample was reanalysed to produce results for the period 1993–2003. This was so that differences arising from the reduction in the sample size could more easily be distinguished from those owing to the change in time period researched. Recall from Table 2.1 that the current sample is 40% of that available in IPF (2005) for the shorter period.

[4] Note that records which could be clearly identified as ground rent investments, of which there are a number in the IPD database, have already been removed from this sample.

3. RESULTS – SEGMENTS

Table 3.3: Rental depreciation – comparison with IPF 2005

	IPF (2005: p.57)	Current dataset	
Sector	**1993–2003**	**1993–2003[1]**	**1993–2009[1]**
Standard Retail	0.3%	0.2%	0.3%
Office	0.8%	1.1%	0.8%
Industrial	0.5%	0.6%	0.5%
Std Ret – South East	0.2%	-0.1%	1.0%
Std Ret – Rest of UK	0.5%	0.5%	-0.7%
Shopping Centre	0.1%	0.3%	0.1%
Retail Warehouse[2]	1.2%	1.8%	0.9%
Office – City	0.1%	0.7%	0.5%
Office – West End	1.1%	1.7%	1.1%
Office – Rest of SE	0.7%	0.8%	0.8%
Office – Rest of UK	1.5%	1.9%	1.8%
Industrial – SE	0.3%	0.4%	0.3%
Industrial – Rest of UK	1.1%	1.3%	1.0%

[1] A negative figure denotes appreciation, i.e. the rental values of the assets have grown faster than those of the benchmark hypothetical buildings.
[2] In column 4, Retail Warehouse depreciation is measured over the period 1993–2006.

From Table 3.3, it can be seen that, at a sector level, the updated rental depreciation rates are, in fact, identical to those that were reported in IPF (2005). Yet this similarity is somewhat illusory for two reasons. Firstly it can be seen that the current sample does not behave completely like the earlier and larger dataset over a common time period, although the relative ranking of rates across the Office, Industrial and Standard Retail sectors is preserved. Secondly it can be seen that, in some instances, the segment rates show large differences from those found in the earlier research. Looking across all the columns, rates of depreciation appear to have been stable across samples and measurement periods for the Shopping Centre, regional Office and Industrial markets, but more volatile in the case of the Standard Retail, Retail Warehouse and Central London Office segments.

Looking first at Standard Retail, it can be seen that the unusual regional patterns have emerged in the period since 2003. Before this, results on both the old and current samples conform more clearly to expectations about how depreciation in this sector should behave. In contrast, the behaviour of the City and West End Office results is harder to pin down. The current sample appears to be comprised of those buildings that depreciated more strongly in the IPF (2005) study. However, over the longer horizon, the per annum rates recorded for the current sample reduce. In both cases, the results raise questions about the stability of depreciation rates over time and particularly over the course of the property cycle. This is despite the fact that a longitudinal approach should, to some extent, mitigate the influence of individual years.

In Table 3.4, the comparison of capital expenditure rates is based on the method used in both studies, namely to divide total expenditure by a summed set of capital values over the periods concerned. It is notable when comparing columns 2 and 3 that the current sample appears to comprise properties that had less spent on them over the period 1993–2003, since the expenditure rate is lower for every segment when based on the dataset for this update. The reasons for this are unclear. It may be that properties which incurred more expenditure became less popular with fund managers as a result and were subsequently traded. Alternatively, such managers may have sought to realise any added value from refurbishment through trading rather than retention of the assets. More evidence on the nature and pattern of expenditure is needed, though, before these suggestions can be confirmed.

Table 3.4: Capital expenditure – comparison with IPF 2005

	IPF (2005: p.63)	Current dataset	
Sector	**1993–2003**	**1993–2003**	**1993–2009**
Standard Retail	0.5%	0.4%	0.3%
Office	0.9%	0.4%	0.5%
Industrial	0.4%	0.2%	0.2%
Std Ret – South East	0.4%	0.3%	0.2%
Std Ret – Rest of UK	0.6%	0.5%	0.4%
Shopping Centre	2.5%	1.1%	0.9%
Retail Warehouse	0.8%	0.7%	1.5%
Office – City	1.2%	0.1%	0.2%
Office – West End	1.1%	0.6%	0.5%
Office – Rest of SE	0.7%	0.3%	0.7%
Office – Rest of UK	0.7%	0.4%	0.5%
Industrial – SE	0.5%	0.2%	0.2%
Industrial – Rest of UK	0.3%	0.1%	0.3%

Lower capital expenditure rates continue to be found for most segments when the measurement period is extended to 2009. It can also be noted that the same ranking at a sector level has been preserved, with offices continuing to require the highest, and industrial assets the lowest, rate of expenditure overall. Finally, at a segment level, the low expenditure rate for the City of London Office sample is again notable when compared with that for the sample available in IPF (2005). Also, Retail Warehouses have usurped Shopping Centres as the segment with the highest rate of capital expenditure overall.

4. RESULTS – INDIVIDUAL PROPERTIES

The results discussed so far have been value-weighted aggregate rates for each sector or segment of the commercial property market. However, they do not indicate whether the rental depreciation or expenditure rates found are typical for all the assets within their respective segments. For example, it might be the case that headline segment rates are skewed by the experience of the most valuable buildings. Furthermore, there may be considerable dispersion in results at the individual asset level. Thus, in this section, individual rental depreciation rates and capital expenditure rates are explored in more detail.

4.1 Rental depreciation

Table 4.1 gives information on the average and spread of individual depreciation rates as measured for the period 1993–2009. Comparing the mean (column 2) and median (column 4) first of all, it can be seen that these figures are very similar in all cases, suggesting that the underlying distributions are not strongly skewed in one direction or another. Furthermore, the unweighted means in column 2 are similar to the value-weighed rental depreciation rates presented in Table 3.1. The main exception to this is Retail Warehouses, where the most valuable assets appear to have had a role in holding the segment level depreciation rate (of 0.9%) down.

Table 4.1: Rental depreciation – mean, median, upper quartile and lower quartile rates

Sector	Unweighted mean[1]	Lower quartile[1]	Median[1]	Upper quartile	IQR
Standard Retail	0.4%*	-1.0%	0.4%	1.5%	2.5%
Office	1.0%*	-0.1%	1.1%	2.1%	2.2%
Industrial	0.4%*	-0.6%	0.5%	1.5%	2.2%
Std Ret – C London	1.9%*	0.1%	1.6%	3.5%	3.4%
Std Ret – Rest of SE	0.7%*	-0.2%	0.7%	1.7%	1.8%
Std Ret – Rest of UK	-0.5%*	-1.6%	-0.6%	0.8%	2.5%
Shopping Centre	-0.2%	-0.8%	-0.2%	0.7%	1.5%
Retail Warehouse[2]	1.6%*	0.5%	1.3%	2.8%	2.4%
Office – City	0.4%	-0.5%	0.3%	2.0%	2.4%
Office – West End	1.0%*	-0.2%	1.0%	2.1%	2.3%
Office – Rest of SE	1.0%*	-0.1%	0.9%	2.0%	2.1%
Office – Rest of UK	1.8%*	1.2%	2.0%	2.4%	1.2%
Industrial – SE	0.1%	-0.9%	0.3%	1.2%	2.0%
Industrial – Rest UK	1.0%*	0.2%	1.4%	1.9%	1.7%

* denotes significance from zero at the 5% level.

[1] A negative figure denotes appreciation, i.e. the rental values of the assets have grown faster than those of the benchmark hypothetical buildings.

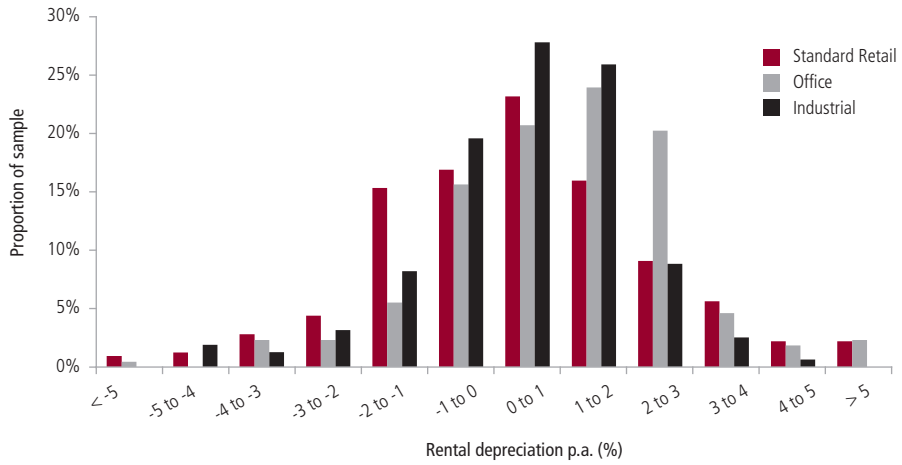
[2] Retail Warehouse depreciation has been measured over the period 1993–2006.

An indication of the spread of rental depreciation rates is given in columns 3 and 5, which show the rates at the lower and upper quartile points of the distribution. Between these two points lie 50% of the observations within each sector or segment. In most cases, these figures indicate a considerable degree of dispersion in individual building outcomes, which is perhaps not surprising given the well-documented heterogeneity of individual property performance (eg see IPF, 2007). It also suggests that segments in isolation are a weak explanatory factor for depreciation. The spread is summarised in column 6, which presents the inter-quartile range in rates (the difference between the upper and lower quartile rates in each case).

The most dispersion can be found in the results for Standard Retail assets in Central London, followed by those in the Rest of UK area and the two Central London Office segments. It is notable that these are the same segments highlighted above as exhibiting the greatest instability in rental depreciation rates over time. Meanwhile, the most concentrated segments in terms of individual asset experiences are the Shopping Centre, Rest of UK Office and Rest of UK Industrial segments.

The full distribution of depreciation rates is illustrated in Figure 4.1 for the three sector groups used in this study. In each case, the distributions are reasonably symmetric, though with the Standard Retail distribution slightly to the left of the others given the greater proportion of appreciation rates found in that sample of assets.[5] The graph emphasises the dispersion in depreciation that was experienced by individual buildings over this time frame.

Figure 4.1: Distribution of individual rental depreciation rates by sector



4.2 Capital expenditure

Table 4.2 provides information on the average and spread of capital expenditure rates as measured for the period 1993–2009. These rates are calculated using the formula that divides total expenditure by a summed set of capital values for the period concerned. As in the case of the depreciation rates, the unweighted means (column 2) are similar to the value-weighted segment rates (column 3, Table 3.3). Once again, the main exception to this is Retail Warehouses, where the segment level rate is higher, indicating that the most valuable assets here had more spent on them.

However, comparison of the mean (column 2) and median (column 4) expenditure rates indicates that the distribution of such rates is highly skewed, with a large number of assets receiving either no, or extremely low, rates of (non-recoverable) capital expenditure over the measurement period. In fact, in all cases, the lower quartile rate is either zero or indistinguishable from zero and the median is also indistinguishable from zero in many cases, the main exceptions being Shopping Centres, Retail Warehouses and the regional Office segments.

[5] Note that the null hypothesis of a normal distribution in depreciation rates was rejected at the 5% level in all three cases and at the 1% level for Standard Retail and Industrial samples using a standard testing procedure (Jarque–Bera test).

Table 4.2: Capital expenditure – mean, median, upper quartile and lower quartile rates

	Unweighted mean	Lower Quartile	Median	Upper Quartile	IQR
Standard Retail	0.2%*	0.0%	0.0%	0.1%	0.1%
Office	0.4%*	0.0%	0.0%	0.5%	0.5%
Industrial	0.2%*	0.0%	0.0%	0.2%	0.2%
Std Ret – C London	0.1%*	0.0%	0.0%	0.0%	0.0%
Std Ret – Rest of SE	0.2%*	0.0%	0.0%	0.2%	0.2%
Std Ret – Rest of UK	0.2%*	0.0%	0.0%	0.1%	0.1%
Shopping Centre	0.7%*	0.0%	0.5%	1.1%	1.1%
Retail Warehouse	0.9%*	0.0%	0.3%	1.1%	1.1%
Office – City	0.2%*	0.0%	0.0%	0.0%	0.0%
Office – West End	0.4%*	0.0%	0.0%	0.5%	0.5%
Office – Rest of SE	0.6%*	0.0%	0.1%	0.8%	0.8%
Office – Rest of UK	0.4%*	0.0%	0.2%	0.5%	0.5%
Industrial – SE	0.2%*	0.0%	0.0%	0.2%	0.2%
Industrial – Rest UK	0.2%*	0.0%	0.1%	0.3%	0.3%

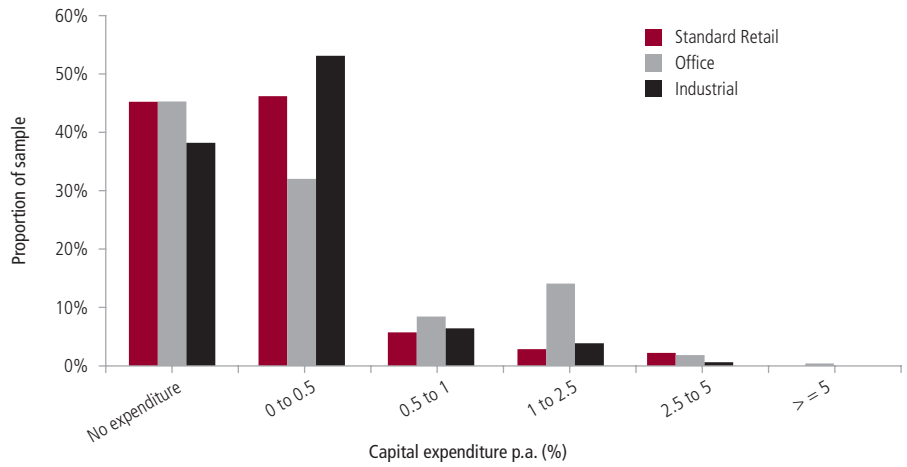
* denotes significance from zero at the 5% level.

Once again, column 6 gives the inter-quartile range in each case as a measure of the spread in rates. As the lower quartile rate is always zero, the inter-quartile range is actually the same as the upper quartile rate. This indicates that Shopping Centres and Retail Warehouses have the largest dispersion in individual asset experiences. Meanwhile, the results for the City Office segment are very surprising in that they indicate that little capital expenditure occurred throughout this sample of buildings, again suggesting that the set of City Offices held over the long term is quite unusual in character.[6]

Finally, Figure 4.2 presents the full distribution of expenditure rates for the three sector groups used in this study. This shows that over 40% of properties in the Standard Retail and Office sectors received no capital expenditure over the study period, with the proportion being slightly lower for Industrial. This is perhaps surprising, although it must be remembered that only non-recoverable expenditure is being monitored in the dataset. The proportions of buildings receiving only very small amounts (0% to 0.5% p.a.) of capital expenditure are also high in each case, whilst the Office sector has the highest percentage of cases in the higher-spending categories.

[6] As noted in section 2.2, properties that have been entirely redeveloped do not enter the sample. This is true regardless of whether or not they were retained in the same ownership post-completion.

Figure 4.2: Distribution of individual capital expenditure rates by sector



This discussion raises questions about the relationship between expenditure and the performance of individual assets. The summary statistics presented above say little about the pattern of spending on assets over time. However, assuming that significant capital expenditure occurs in discrete lumps, it would be interesting for further research to consider whether properties that received it suffered greater depreciation in the preceding years and to what extent values were restored to benchmark levels thereafter. Furthermore, was any subsequent depreciation less than that for a typical asset in its segment? These questions sit within a wider research agenda that is now considered in the concluding section.

5. CONCLUSION

The overall depreciation rates for the IPD Standard Retail, Office and Industrial segments are 0.3%, 0.8% and 0.5% p.a. respectively over the extended time series from 1993 to 2009. This compares exactly with the results from the previous IPF (2005) study based on a larger sample but shorter time frame. Unfortunately, what appears to be a totally stable set of results is not so stable when the smaller sample for the latest study is compared to the shorter time frame for the previous study – the results for the current sample over the period 1993–2003 are 0.5%, 1.6% and 0.4% p.a. for Standard Retail, Office and Industrials.

The measurement of capital expenditure has been undertaken in two different ways. If measured in the same way as for the previous 2005 study (the total expenditure over the whole period as a proportion of the sum of the annual capital values over the whole period), it suggests less expenditure at 0.3%, 0.5% and 0.2% p.a. for Standard Retail, Office and Industrial segments than was the case in the IPF (2005) study (0.5%, 0.9% and 0.4% p.a. respectively). If the current smaller sample is measured over the original period of 1993–2003, the rates are also lower at 0.4%, 0.4% and 0.2% p.a., indicating that properties sold since 1993 had had more expenditure on them in the period before the sale than the held properties. If the measurement is based on the initial capital value in 1993 the capital expenditure rates are 0.4%, 0.6% and 0.3% p.a. for Standard Retail, Office and Industrials over the period 1993–2009.

Rental depreciation and capital expenditure rates for IPD PAS segments are also set out in this report and the overall sector-level depreciation rates mask considerable variation at a segment level, particularly in the case of Standard Retail. In Office and Industrial, the variation is not unexpected; in retail, the results are more difficult to interpret.

This study is the third of a series of studies of depreciation of investment property funded by the Investment Property Forum. All three studies have used a longitudinal approach to identify primarily rental depreciation rates across the different property segments in the UK and offices in Europe and Phase 1 of this project extended the period of measurement of the UK market from 1993–2003 to 1993–2009. In order to preserve the consistency of the new results with the old, there have been no changes to the precise methods of analysis used or to the dataset. The only changes relate to the diminishing sample size caused by the need to have properties that remain in the dataset at the beginning and the end of the period. However, each of the studies has raised issues concerning both method and data and the remainder of the discussion focuses on these questions.

There is little doubt that the longitudinal approach is theoretically superior to a cross-sectional approach but all three IPF studies have isolated a number of concerns about the application of this approach that we now feel are timely to revisit. The use of benchmarks and the use of valuation-based data have both been highlighted as practical limitations, especially in IPF (2010), which may cause instability of the results, over short periods. Increasing the time span of the research should have increased the stability of the results but this may not be the case due to the smaller sample size, and the stability of the results needs further investigation. For example, the revised sample size for the current set of results totals 742 properties whereas in IPF (2005) the total number of properties was 1870. Not only do differences in the outcomes of the updated and the previous results need further investigation, but the methods by which these results were obtained also demand further scrutiny.

This is especially important if a wider set of questions concerning depreciation are to be investigated. Average rates of depreciation can be identified for different segments but these segments include, for example, different age cohorts and different lease structures. As with any property data analysis, there will be wide variation in the results for each individual property and this variation needs to be investigated and understood. The current method of measuring depreciation includes historic IPD data and that data has been developing though time. This is especially

true for the lease data within IPD which has only been retained since 1998. The improvement in the data since then may enable a more detailed investigation of the characteristics of the cohort and their relationship to value change and depreciation. The start and end dates of any analysis may be important with rental values being more difficult to determine at different times in the rental value cycle. Other characteristics may relate to prime and secondary property in terms of location and property quality, which in turn leads to different relationships between land and building value within the same property. Conceptually, depreciation over a portfolio should relate to the building only with the site value potentially subject to either relative depreciation or appreciation. The impact of location has not been investigated within the existing studies and needs to be included.

The shape of depreciation has not been investigated for the UK, although an attempt was made to identify year-on-year depreciation rates for the European office market in IPF (2010). The shape may well differ dependent upon the other possible influences discussed above; for example, it could be hypothesised that after a certain age, for some property types, depreciation will be zero. Also, it would be interesting to try to identify the initial depreciation rate of new buildings and, thus, the new IPD development database needs to be examined to see if it can be utilised for a study of new buildings. Functional obsolescence may appear overnight by a change in technology, so the design and flexibility of an asset is important. As data improves more of these possible influences can be identified within the data set and be included in the analysis.

Analysis of the data over different market states should be undertaken. In IPF (2010), the data start and end dates coincided with a full market cycle. The UK study started in 1993 and used rental values. However, 1993 was a time of great uncertainty regarding the level of rental value, owing to the introduction of incentives and other means of hiding or distorting the evidence on which rental value estimates were based (Crosby and Murdoch, 2001). The impacts of start date and end date on the sample size and the results need further investigation.

Other issues with depreciation concern expenditure and, as in previous studies, this study has measured the extent of capital expenditure on the rate of depreciation. There are issues about how this is measured and communicated and this report, in addition to measuring consistently with previous studies to create comparable results, has also suggested a new basis for measurement. The alternatives need further consideration.

There is, therefore, a set of research questions that needs examination to help our understanding of the headline depreciation results in this report. To summarise, they include:

- Is the longitudinal method working and are there other methods that can be applied successfully to the measurement of depreciation?
- Does the rate of depreciation vary over time? Do properties depreciate more over the first few years, post-completion, or does depreciation accelerate as the building ages?
- Do different segment characteristics have an impact on depreciation rates and can these be isolated from the existing data? Possible segmentation of results, other than by main property sectors, could include, for example, age, building size and lease structure.
- How does the rate of depreciation vary with the property cycle and do prime and secondary buildings behave differently in the different market states? Does depreciation accelerate during booms, as the design of new buildings responds more quickly to changing occupier requirements? Or does it fall, as demand cannot be met by a limited supply of prime buildings? Does the market state at the valuation date impact on the ability to correctly identify rental values for both the sample and the benchmark?

5. CONCLUSION

- Can the methodology of research established in the original study be applied to other countries, and comparisons be made on an international basis?
- Can the impact of physical causes on the rate of depreciation be identified and measured?
- What is the effect of capital expenditure on depreciation, through major works of refurbishment or redevelopment, and is this impact being captured accurately within the current method of measurement?

Many of these issues were identified as areas for further study in 2005. Apart from the study of international markets, which was attempted in 2010, the rest have not yet been addressed and so they still form the basis of an agenda for further study.

REFERENCES

CB Richard Ellis (2007), **A Guide to the CB Richard Ellis Rent and Yield Monitor – Rent Index and Average Yields, Quarter 1 2007**, London: CB Richard Ellis.

CEM (1999), **The Dynamics and Measurement of Commercial Property Depreciation in the UK**, Reading: College of Estate Management.

Crosby, N. and Murdoch, S. (2001), Basis of rental value for performance measurement systems, **Journal of Property Research**, 18 (2): 123-139.

IPF (2005), **Depreciation in Commercial Property Markets**, London: Investment Property Forum.

IPF (2007), **Risk Reduction and Diversification in Property Portfolios**, London: Investment Property Forum.

IPF (2010), **Depreciation of Office Investment Property in Europe**, London: Investment Property Forum.

Law, V. (2004), **The Definition and Measurement of Rental Depreciation in Investment Property**, Unpublished PhD dissertation, University of Reading.

Printed on recycled paper

Investment Property Forum
New Broad Street House
35 New Broad Street
London EC2M 1NH

Telephone: 020 7194 7920
Fax: 020 7194 7921
Email: ipfoffice@ipf.org.uk
Web: www.ipf.org.uk