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Key Contributions of IPF Research to Property Investment Processes in the UK

OPINION PAPER

COMMISSIONED BY THE IPF RESEARCH PROGRAMME

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This Programme supports the IPF's wider goals of enhancing the understanding and efficiency of property as an investment. The initiative provides the UK property investment market with the ability to deliver substantial, objective and high-quality analysis on a structured basis. It encourages 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 businesses, representing key market participants. The IPF gratefully acknowledges the support of these contributing organisations:

FOREWORD

Since the first property industry research teams and independent property research consultancies were established in the UK in the 1980s, the findings of those teams have been incorporated into investment managers' property investment processes. To enable and support the industry's research efforts the Investment Property Forum (the IPF), along with the IPF Educational Trust, established the first of a series of Research Programmes in 2003, with the current one funded until mid-2022.

Now, almost 20 years since that first initiative, this report goes back to those beginnings and considers the key contributions that this industry-funded, IPF-enabled research has made, or perhaps could have made, to property investment processes. In doing so, this report brings to the fore and exemplifies some of these reports, their findings and their potential impact on property investment processes.

The selection of the set of reports discussed here is, of course, subjective and they only focus on the discrete area of research contributing to property investment processes. It is just one perspective and you will have your own views on what is important in amongst the body of work that has been produced. Nonetheless, you will see that these reports range from the very first Research Programme to the current day and cover themes such as risk, depreciation, forecasting, performance, property lending and pricing. These are key elements that need to be considered when building an investment process.

I trust that you will enjoy reading this report, perhaps re-learning some of the research's important findings, using this paper as an entry point into their findings, or noting that there remains much to be understood whilst we go about our day-to-day business.

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Key Contributions of IPF Research to Property Investment Processes in the UK

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EXECUTIVE SUMMARY

- The IPF's industry-funded research programmes started in 2003 and have delivered a considerable body of work.
- The research has often been carried out by notable researchers and practitioners, supported by expertise and funding from across the industry.
- The aims of this report are to:
  - review the body of work,
  - extract papers that (could) have made key contributions to an investment process,
  - provide a brief summary of each report, highlighting *inter alia* some of the key implications of its findings for a property investment process, and
  - draw together these findings and implications and offer avenues for potential further research.
- The report is by no means exhaustive, covering just nine of the many pieces of research that the IPF has produced. Within each report the summaries provided are not comprehensive either, focussing in on a handful of the potentially more impactful findings.
- There are numerous examples of research findings that (could) have been incorporated into an investment process and readers are encouraged to study the full reports.
- Key implications of the studies reviewed here are that:
  - Depreciation can be defined and measured in a consistent way. Nonetheless, depreciation is perhaps not as well understood, still, as it could be, particularly the linkage between optimal capital expenditure and observed depreciation.
  - People are an important part of the investment process and, being human, they have the potential to execute sub-optimal decisions. Being mindful of this in the design of an investment process should promote better decision-making.
  - Risk is ever-present, and understanding it and its influence on returns is key to the construction of portfolios that are aligned with clients' objectives.
  - It is beneficial to consider risk-adjusted performance. Confusion as to luck or skill can easily arise if only analysing non-risk-adjusted returns. For instance, it is possible to consistently underperform the market but also deliver risk-adjusted outperformance.
  - Not only may people influence decisions but metrics and methods that are sub-optimal may be being used to make those decisions. An awareness of the limitations of industry-standard metrics may promote improved decision-making.
  - Whilst decisions are made based on the state of markets now, longer-term views of value may be useful in deciding how to manage capital through the ups and downs of the property market and how to think about property lending.

2 Key Contributions of IPF Research to Property Investment Processes in the UK

1. INTRODUCTION

The Investment Property Forum (IPF) has long understood the role of research in UK property markets and first made this explicit in 2003, building a consortium of major industry organisations to sponsor, along with the IPF Education Trust (IPFET), a three-year-long programme of research. Subsequently, this programme has been refinanced several times and now a considerable body of IPF-funded research exists, produced by notable academics and practitioners and supported by project steering groups drawn from across the industry.

Of course, the research that has been undertaken is not limited to that which might contribute to a property investment process, but this is the topic of interest here. The role of research within the property investment process is, now, quite longstanding, with institutional property research teams first being built in the UK in the 1980s. This was the beginning of property-industry-specific research feeding directly into investment processes.

Those processes can vary considerably amongst organisations but, at their heart, they all aim to deliver a systematic and repeatable approach towards the creation of property portfolios and the selection of the individual assets that comprise them. They all deal with similar, if not the same, set of questions surrounding risk and return and seek evidence, drawn from research, upon which to build their own brand of investment process.

This report looks back at that body of work and seeks to draw out key pieces of work from within it that (should) have influenced the industry's investment processes. The studies that have been selected are almost timeless, in that they have considered some of the more difficult questions and produced frameworks and/or answers that should be considered in any property investment process. Their power is often in providing us with a way to think about an issue. Drawn from across the IPF's research programmes, they are a reminder of the quality and practical relevance of the research carried out by the IPF's research programmes over the years.

Practically, this report provides a summary of the research presented in each paper and some of the key findings: this may serve as a reminder or an entry point for the original research. Many of the reports are 'results dense', which means that the findings and implications for an investment approach that have been presented will have been selected from amongst the results that could have been presented. This is inevitable, with some reports totalling over 80 pages, but the report aims to draw out those with the potentially greatest implications. The original IPF reports are rich sources of information for the interested reader wishing to understand a particular topic and will take time not only to read from cover to cover but to digest and consider potential implications. Some of that work is done here but it is certainly not exhaustive, with readers being encouraged to look back at the original reports.

The remainder of this report is arranged by considering next, summaries of each of the nine reports and their implications for property investment processes, with a number falling under the themes of 'risk' (2.4 to 2.7) and 'pricing' (2.8 and 2.9). The report concludes with some observations on what we can learn from the reports and openings for further research. An appendix is added to provide a list of the full set of research reports produced on behalf of the industry-funded IPF's research programmes.

2. REPORTS

The identification of the key reports produced by the IPF that have influenced the property investment process is ultimately subjective; however, several criteria have been used to help to identify the set of reports that are presented here. These are as follows:

- What is the potential level of impact of the report on a property investment process?
- Is the research progressive? Does it move, or should it have moved, the industry forward?
- Is the report innovative?
- Does the report provide clarity on a critical topic?
- Does the report have practical implications that should be considered?
- Is the report relatively timeless?

The first report comes from the very first research programme and considers the ever-present topic of depreciation, a topic to which the IPF has returned a number of times over the years.

2. REPORTS

2.1 Depreciation in Commercial Property Markets (July 2005)

Andrew Baum, Mark Callender, Neil Crosby, Steven Devaney, Vicki Law & Clara Westlake

2.1.1 Introduction

The topic of depreciation is unavoidable in any discussion surrounding property investment and its understanding is a critical part of a property investment process. Unlike many other asset classes, property tends to depreciate; the level of income that a property can command now is net of past depreciation, its expected future income growth will be net of expected depreciation and the yield, or yields, applied to that income will need to reflect the risk of realised depreciation being different to expected depreciation.

This report, from 2005, set out aiming:

1. to define depreciation and deal with issues surrounding its measurement;
2. to establish an appropriate methodology for the measurement of depreciation;
3. to measure historic depreciation rates in the UK; and
4. to relate depreciation to investment vehicles. This chapter was submitted to HM Treasury to be considered as part the discussions around a tax transparent UK property vehicle, an ongoing topic 15 years later.

The report leaves us with a comprehensive review of the topic of depreciation. Here we discuss only the first two aims noted, since the findings from these are broadly applicable to any property investment process. The third aim, namely measuring historic depreciation rates, is now considerably out of date and, in recognition of that, the IPF commissioned further research into the topic in 2011 and 2013 and researchers regularly re-calculate historic depreciation rates. The fourth aim is related to property investment vehicles and not part of a direct property investment process.

2.1.2 Definition and measurement

Several depreciation studies have been carried out, all resulting in different estimates of depreciation rates. These differences can be accounted for in a number of ways:

- different datasets;
- different time periods;
- different measurement methods; and
- different actual rates of depreciation.

The first challenge then was to define depreciation so that a measurement method could be put in place. The authors proposed their definition of depreciation as:

> "the rate of decline in rental/capital value of an asset (or group of assets) over time relative to the asset (or group of assets) valued as new with contemporary specification" from Law (2004)[1].

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

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The authors noted that it is more straightforward, though not easy, to measure rental depreciation than capital depreciation. Capital depreciation cannot directly be measured because any changes in value are not only due to depreciation but also due to changes such as lease characteristics (length, terms, etc.) or risk. The authors termed capital depreciation "capital shift", as it is not true capital depreciation but the reflection of a bundle of changes over time.

Once defined, it was possible to evaluate the alternative approaches to the measurement of depreciation, which the authors did thoroughly, and to construct an appropriate, best-practice measurement approach. The authors then proposed the following formula, which again follows Law (2004)[2]:

$$d = 1 - \{[\Sigma Rs,t2/\Sigma Rs,t1]^{(1/(t2-t1))} / [\Sigma Rb,t2/\Sigma Rb,t1]^{(1/(t2-t1))}\}$$

where: Rs is the rent on the sample property/properties

Rb is the rent on the benchmark property/properties

t1 is the beginning time period

t2 is the end time period

At this point the authors went on to discuss an appropriate methodology so that this formula can be applied.

2.1.3 Methodology

Several methodological issues arose when considering how to apply the definition of depreciation and the measurement formula above to property data. The perfect situation would be availability of:

1. The rental value of a property, or group of properties, at time t1 (the beginning of the measurement period) when the property is new, and no depreciation has taken place;
2. The rental value of a property, or group of properties, at time t2 (the end of the measurement period) where there has been no capital expenditure between t1 and t2, i.e. the asset has been subject to full depreciation; and
3. The rental value of the same property, or group of properties, at time t2, valued as new with contemporary specification.

Regarding condition 1, it is likely that the property, or group of properties, will not be new and will already have been subject to a level of depreciation. It is then difficult (though potentially not impossible) to disentangle the measurement of the depreciation rate from the pattern of depreciation (how the depreciation rate varies during a property's life). As such, the measurement of a depreciation rate is likely to be a joint estimate of not only the rate of depreciation but also the pattern of depreciation. That is, it is possible that depreciation rates that are found for one sample of properties might have been different for the same sample of properties if measured over a different time period, when the properties were at a different starting and/or ending age.

[2] Ibid.

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Regarding condition 2, it is easy to see that this is unlikely to be met since capital expenditure will have been utilised between t1 and t2; it is highly unlikely that an owner will have done nothing in terms of maintenance or improvement expenditure. In this way, only "observable depreciation" can be measured, which is likely to be at a lower level than had no expenditure taken place and that the extent of capital expenditure may not have been optimal. Indeed, it is one of the goals of asset management to ensure that properties are maintained and improved to ensure that rents are maximised/optimised. It may be that the goal should not be maximisation of rent but that asset management should only be employed to the point where the rate of marginal gains are positive i.e. it may be possible to improve rent by £0.01 psf by spending £100 psf but that may not make much sense, but a £5 psf gain for a £1 psf of expenditure may make sense. In effect, there is likely to be a tipping point where it does not make sense to put more capital expenditure into the asset for a small marginal gain in rent.

Regarding condition 3, this is a hypothetical estimate of rent that will be subject to uncertainty.

Given that the perfect set of data is not available, the authors then discussed the usefulness and limitations of various datasets and benchmarks ultimately favouring CBRE's *Rent and Yield Monitor* as "the most appropriate available index for use as a benchmark in the measurement of depreciation".

2.1.4 Implications

This IPF report addresses some key questions in the definition and measurement of depreciation. Whilst the magnitude of historic depreciation is interesting in itself, it is future depreciation that needs to be considered and historic results interpreted and adapted on a case-by-case basis for each property or group of properties when underwriting an investment. This paper allows depreciation (at least observable depreciation) to be measured in a consistent and appropriate manner. The results of historic analyses can be updated on an ongoing basis and baseline assumptions introduced to the underwriting process by sector, segment, location, lease length or any other factor.

The paper provides a solution to the question of the definition and measurement of depreciation but in doing that, it also highlights complexities that must be dealt with on a day-to-day basis when underwriting properties. For example, the uncertainty in any underwriting assumptions should be reflected in the risk premium that is applied to the expected future cash flow and/or various depreciation rates could be explicitly modelled through the cash flow (along with varying capital expenditures) giving a range of possible cash flows.

The potential impact of this report is wide-ranging and it is a report that should be read and understood, so that a property investment process is set up to address the question of depreciation within it and also so that those implementing the process are aware of the range of the uncertainty surrounding, and the accuracy of, their assumptions.

The power of this report is to provide a consistent and clear starting point in the understanding of depreciation and so to offer a framework with which to think about the unavoidable issue of property depreciation within an investment process.

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2.1.5 Subsequent papers

Following on from this study of depreciation, the IPF produced these subsequent papers:

- Depreciation of Investment Property in Europe (2010)
- Depreciation of Commercial Investment Property in the UK (2011)
- Modelling Causes of Rental Depreciation for UK Office and Industrial Properties (2013)

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2.2 Disagreement and Uncertainty in UK Property Market Forecasts (2006)

Patrick McAllister, Graeme Newell & George Matysiak

2.2.1 Introduction

Since property investment processes are concerned with the future, the production of forecasts in some form constitute a cornerstone of many, if not all, property investment processes used in practice. The IPF has, since 1998, succeeded in creating and publishing a series of consensus (average) forecasts in the UK[3] from industry participants on key sector/segment variables of interest, such as rental growth, capital return and total return. These are of interest to those using a top-down approach to drive sector/segment portfolio allocation decisions and to those making multi-asset decisions.

This unique set of data gives the researchers the ability to ask questions around the accuracy/disagreement of these forecasts, particularly when individual contributors' forecasts that form the components of the consensus can be anonymised and compared. This paper is the first paper to have asked those questions, with the IPF funding further research into the topic in 2012. The report aims to investigate the nature, extent and patterns of disagreement and uncertainty within the set of forecasts. The researchers do this by assessing the forecasts across several metrics and across various time periods. There were up to 27 participating organisations: property advisors, fund managers and equity brokers. The forecast surveys date from 1998 to 2004.

The authors rightly point out very clearly that disagreement and uncertainty are inevitable and that, since property forecasts necessarily depend upon other forecast variables, for example GDP growth, inflation or interest rates, to produce them, the accuracy of property forecasts will be affected by these. They also compare property forecasting accuracy with non-property forecasting accuracy.

2.2.2 Disagreement

As noted, disagreement (dispersion around the mean) amongst forecasters is inevitable but the extent of that disagreement is of interest as it may contain useful signals and information about future market performance. For instance, the authors cite work in other markets where research has shown that the greater the level of disagreement, the lower the subsequent level of return. They also cite work that has found that, the greater the level of disagreement, the greater the level of forecast errors.

The findings of the report indicate a high degree of agreement between forecasters, "the evidence of a consensus among property forecasters is strong". The authors also state that they "find remarkably similar patterns for non-property forecasters". This tendency to 'herd' does not, therefore, appear to be a feature unique to property forecasting and, behaviourally, the producers of forecasts may concentrate on not being an 'outlier', which comes with negative connotations. The potential issue with herding is that of accuracy and the decisions that may be taken based upon the forecast, since, if the forecasts of each individual component of the consensus are close and similarly inaccurate, the costs to the industry may be high.

[3] A shorter time series is also available for Europe ex-UK.

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This first level of analysis gives some early indications of accuracy, with outcomes for capital return and total return often being outside the range of the forecasts, e.g. a forecast range for capital return could be from 1% to 5% but the outcome may be 0%, i.e. outside the range of the forecasts. Forecasts for rental growth, however, appeared to be more accurate than those for capital return or total return, suggesting that the accuracy of yield forecasts may be lower.

2.2.3 Accuracy

Forecast accuracy is important as errors can create losses in several ways. For example, if a forecast return for one sector is 7% and another is 6%, it may not prompt any significant repositioning of a portfolio but if the outturn is 12% and 2% respectively then greater repositioning may have added value. Similarly, if a forecast indicates continued positive capital return but the outturn is a negative capital return (a turning point) then excessive capital may be put at risk.

Some simple analysis of the accuracy of the forecasts, using mean (absolute) error, which indicates on average how much the consensus forecast differed from the outturn, suggests three things:

1. Rental growth forecasts tend to be more accurate than those for capital return and total return;
2. Rental growth forecasts are the key driver of the profile of capital return and total return forecasts, rather than yield shifts; and
3. The forecasters are better at forecasting rental growth than yields (implied through the relatively less accurate capital return forecasts).

The choice of the metrics used to assess accuracy is not a trivial question and, to some extent, it is possible to flatter forecast accuracy by using metrics that are not hard to better. For this reason the authors use a metric that overcomes two problems, first, the problem of scaling (data that can have large values may have large errors, allowing a comparison across different property variables, i.e. rental growth, capital return and total return, or across different sets of forecast data, i.e. property versus economic) and, second, the problem of comparative accuracy, ensuring that each forecast is compared, at least, to one that could have been made with no knowledge of the future. This metric is Theil's second inequality coefficient, which has natural calibration points around a value of 1, and is parameterised such that a value of 1 equals the forecast that a naïve model could have made, i.e. the forecast of 'same change as last year' (a value of less than one and it is more accurate than the naïve model, more than 1 and it is less accurate).

Using this metric, the authors find that for rental growth, capital return and total return the forecasts are better than the naïve forecast in three years out of five. A similar result is obtained when looking at forecasts for economic data (inflation, GDP growth, base rates, etc.). However, the authors state that "it is only for GDP growth that there is clear-cut evidence that forecasters consistently outperform the naïve forecast".

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2.2.4 Bias

The question of bias within forecasts would indicate a degree of predictable errors, with forecasts being predictably too low or too high, and that the forecasts are not rational. This could have major implications for making consistent errors in the property investment process. The tests applied to consider bias are:

- Non-zero mean forecast errors (the average error is not equal to zero);
- Serial correlation in forecasts errors (over-optimistic forecasts tend to be followed by over-optimistic forecasts and vice versa);
- Significant correlation between forecast errors, a constant and the errors themselves; and
- Correlation between the forecast errors and a set of variables that would have been used as information in producing the forecasts (e.g. are the forecast errors related to a factor such as GDP growth).

The authors find evidence that:

- The forecasts display systematic bias: when performance is improving, total returns tend to be underestimated and vice versa;
- The forecast errors tend to be serially correlated: positive errors follow previous positive errors;
- As the forecasts are updated during the year, based upon new information, bias tends to continue; and
- Forecasts for the current year tend to be more biased than forecasts for subsequent years.

2.2.5 Persistence

Of additional interest is the question of whether any particular forecasters were able consistently to deliver more accurate forecasts than others. Analysis of this potential persistence within this study showed that:

- No forecaster was in the top quartile in all six years of the analysis for any variable, i.e. rental growth, capital return or total return;
- A greater level of persistence was shown when forecasting rental growth; and
- For capital return and total return, there was little, if any, persistence with a top-quartile performance potentially being followed by a bottom quartile performance

The authors are keen to point out that this pattern of a lack of persistence is not unusual across other forecast variables, e.g. GDP growth, inflation, etc.

2.2.6 Implications

This report delivers a set of findings that are perhaps not unsurprising, given that similar findings can be found in other domains. However, the report draws out a number of features, which, when operating a property investment process, industry participants should be mindful of. First: it appears to be more straightforward to forecast rental growth than to forecast capital return and total return, indicating the difficulty of predicting yield shifts. Second, forecasts tend to be biased and consistently and continually under-estimate change in both directions. Third, "a clear-cut finding is that most property forecasting organisations tend to be close to the consensus but that the consensus is prone to substantial uncertainty".

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The implications of this research for those operating a property investment process that includes forecasting as part of it are numerous. Some simple examples include:

- Greater reliance can likely be placed upon rental forecasts than yield forecasts (and, consequently ,capital and total returns). When considering two-variable sensitivity analysis using forecast rental growth and yields, which many will do as part of their asset underwriting, it would seem sensible to ensure that the yield differences from base case are far broader than those for rental growth, given the potentially far greater uncertainty and inaccuracy of yield forecasts compared to rental growth forecasts.
- If you are producing forecasts and your forecasts are inaccurate, they are likely to be inaccurate along with the other forecasters that make up the consensus. They may be more accurate than the consensus but knowing this in advance and persistently appears unlikely. Testing one or two non-consensus scenarios, however unlikely they are perceived to be, would seem a sensible response to this to see what impact that might have upon investment decision-making.
- Constructing an investment process that is not overly reliant upon the accuracy of yield forecasting may be desirable.

2.2.7 Subsequent papers

Following on from this study, the IPF produced the following papers:

- The IPF UK Consensus Forecast and the Returns Implied by Property Derivative Pricing: Evolution, Record and Influence (2009)
- The Future of Property Forecasting (2012)
- Reassessing the Accuracy of UK Commercial Property Forecasts (2012)

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2.3 Property Stock Selection: Organisation, Incentives and Information (2006)

Paul Gallimore, Patrick McAllister & Cathy Hughes

2.3.1 Introduction

This study set out to consider organisational and decision-making aspects of property investment processes at the stock selection level. Whilst much of the research around investment processes has focussed on numbers in one way or another, risk, return, target rates, forecasts of rental growth, etc., this study introduced several behavioural economics' models and psychological perspectives into the discussion and looked at issues that may arise around the search, selection, underwriting, transaction and approval processes.

This is interesting, as the operation of an investment process is not only a mathematical exercise but also one that revolves around people and the abilities of the participants in the process to make good decisions. Decision-making is influenced by many factors, not just the numbers, and how those decisions are taken in practice gives valuable insight into potential issues arising from the softer aspects of decision-making in an investment process.

To be able to get inside these processes, the authors conducted interviews with fund managers, asset managers and transaction specialists. Even though this report is from 2006, the types of conversations that are going on inside organisations now may remain substantially the same, with the same challenges. The timing of the research is interesting in itself, as it was undertaken during a period of strong growth and pressure to deploy capital.

2.3.2 Organisational structures and remuneration

The authors found similarities between the organisations that they interviewed with two main organisational models in operation:

1. Specialist in-house buyers, where speed, benefits of concentrated stock sourcing, market knowledge and contacts was stressed, and
2. In-house roles, which combined transactions and asset management, and where risk control, following on from needing to asset manage the property that had been purchased, was stressed.

Organisations proved adaptable to the needs of the business when the market was strong, i.e. moving the focus of activity towards buying. The authors flagged that the focus on purchasing activity may be to the detriment of long-term issues, such as asset management and, so, onwards to performance. The authors found no evidence of remuneration incentives distorting organisational performance since team working was emphasised.

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2.3.3 Introductory agents and agency costs

The inherent conflict between an introductory agent only being paid where a purchase is made (usually at the highest offer price) and giving impartial advice is one that the industry continues to grapple with. The study found that the industry was fully aware of this potential conflict and that buyers and introductory agents alike were mindful that agents' potentially opportunistic behaviour was counter-balanced by a need for repeat business. It was also clear that the industry valued the role of introductory agents in uncovering assets for purchase.

2.3.4 Information and decisions

The authors of the study found that most of the stock that was introduced to potential buyers was rejected and that it was at this point in the process that subjective judgements were most overtly in play. Where assets were taken forward for consideration, each organisation had to produce and use an array of information in the underwriting process. This typically involved the use of forecasts of several variables that moved from the more generic (a sector/region) to the specific asset being considered. These assumptions were scrutinised by fund managers and, typically, an investment committee. The study identified no less than 20 such variables, all subject to uncertainty, including data such as rent levels, rental growth, depreciation, exit yields, target rates of return, capital expenditure, void assumptions, etc.

The study highlighted two aspects where there was particular concern regarding the inputs, namely depreciation (the topic of several IPF research reports) and target rates of return (also now covered in depth by the IPF Research Programme).

The authors concluded that it was difficult to see how any individual within an organisation could depart from house policy, given the collaborative nature of the process. They did, however, highlight that there was the potential for market circumstances to create pressure that might alter the nature of the process, resulting in sub-optimal decisions.

2.3.5 Psychological aspects of the decision-making process

In carrying out the search and selection of properties for investment, people and organisations need to make a number of judgements about what information they use, much of which is about the future and, therefore, subject to uncertainty, and how it is incorporated in their decisions. This requires people and organisations to form beliefs and expectations, and the way in which they do so can be biased and, so, not rational. The authors highlighted the influence that psychological factors can have on decision-making. The list of known biases is laid out and each one explained.

The authors were particularly concerned about the prospects for herd behaviour in property markets (as in other financial markets), where decisions are uncertain and where such behaviour may reduce regret and dampen the sense of responsibility if losses materialise. At the time, however, they found no evidence for this.

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2.3.6 Implications

The decision as to how to organise a property investment process around buying assets typically result in one of the two structures described: specialist in-house buyers or more generalist (i.e. combined asset management and transaction activity) in-house buyers. Each has their merits and each their weaknesses. Where specialist buyers are used, an investment process may wish to ensure that appropriate checks and balances are put in place to address the potential for asset management issues and the costs of these to be neglected. This could be done by ensuring that the separate asset management teams are involved in the purchase decision, whether through the underwriting assumptions or more formally through an investment committee. The authors found that during a strong market it may be that asset management is neglected in favour of buying volumes and, again, an investment process should be designed to minimise that conflict.

In the process of underwriting individual purchase decisions, the study suggests that an investment process should ensure that the risk of sub-optimal decisions at the organisation level is addressed, particularly when confronted by strongly growing markets. The design of an investment process should be mindful of how individuals and groups come to a set of beliefs and expectations. There is a long list of potential biases at individual and group level that a well-designed investment process would seek to avoid or at least minimise.

2. REPORTS

2.4 Alpha and Persistence in UK Property Fund Management (2008)

Paul Mitchell & Shaun Bond

2.4.1 Introduction

This paper deals with two[4] important questions:

1. The ability of managers to deliver outperformance persistently, identifying whether performance is likely to have been the result of luck or skill, and the implication that the historically skilled may continue to be skilled, and,
2. The question of risk-adjusted performance and the ability of managers to deliver risk-adjusted outperformance, usually of a benchmark, or positive alpha. This is important since comparisons of performance can be offered without any comparison of the risks taken to arrive at that performance or risks can be bucketed into broad and absolute styles, such as core, value-added and opportunistic.

Higher returns may simply be the result of higher risk but even in such cases, the additional return may not be enough to compensate the investor for the additional risk taken. It is also possible, of course, that lower-risk funds can outperform higher-risk funds and, typically, this happens in falling markets.

Key for those constructing an investment process is this paper's work on explaining any persistence and alpha, that is, what is it that drives persistence and alpha?

The discussion of risk-adjusted performance has a long history, dating back to 1968 and the work of Jensen[5]. It is from this work and the capital asset pricing model that 'alpha' is derived. It should be noted that alpha is most often discussed in terms of risk-adjusted outperformance but alpha is not constrained to be positive, it is possible that alpha is negative, which would demonstrate a fund's risk-adjusted underperformance.

At the time that this study was carried out, relatively little attention had been given to the topics of persistence in performance or alpha for direct property. As such, this makes the report innovative and marks an important milestone in beginning to understand these issues.

As with many statistical analyses of UK fund performance, the data comes from IPD (MSCI), in this case starting in 1982, the authors having conducted a thorough 'cleaning' of the data to try and remove as many potential biases as possible. It is important to note that these data are gross of manager fees and so any positive findings of persistence and alpha need to be treated with an appropriate degree of caution.

2.4.2 Persistence (not adjusted for risk)

The report looks at persistence by dividing fund performance into quartiles to see how frequently managers remain within quartile and whether top-performing managers in one period remain top-performing managers in subsequent periods. The authors also construct 'transition probabilities', the chances that a fund in a particular quartile remain in that quartile subsequently. The analyses were carried out over one, three, five and 10-year periods.

[4] The report also conducts interviews with investment consultants, the findings of which are not covered here.
[5] Jensen, M.C. (1968), 'The Performance of Mutual Funds in the Period 1945-64', Journal of Finance, Vol. 23, pp 389-416.

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The authors find that there is very little persistence in performance from year to year and that after just two years the top-quartile funds' performance is lower than the bottom-quartile funds' performance. Moreover, the initial bottom-quartile funds then outperform the initial top-quartile funds over the next five years. Slicing the whole period into various vintages, it is possible to find some vintages where there is greater persistence in top-quartile performance; namely 1997, where there are four years of top-quartile persistence, followed, unfortunately, by four years of the bottom quartile outperforming the top quartile.

The authors then look at longer performance periods, of three, five and 10-year performance, since annual performance should, perhaps, be less important for such a long-term asset class. The findings of this analysis give the impression that there is some level of persistence for the very top performers (the top decile) over both three and five years but little evidence for any other persistence. This includes the lack of evidence for poor performers remaining poor performers – poor performers were more likely to rise to be better performers.

The authors note, however, that whilst the very top decile of funds show some persistent outperformance over subsequent years, the extent of that outperformance is somewhat smaller than the extent of their historic outperformance; 6.5% p.a. over three years historically, versus 0.5% p.a. in the future three years.

It is also important to remember that those underperforming may deliberately have followed a low risk strategy and those outperforming may deliberately have followed a high-risk strategy. It is for this reason that it is important to adjust for risk, which the authors then consider.

2.4.3 Alpha (and persistence adjusted for risk)

When looking at alpha, the authors put together a method for risk adjustment of performance. Their bespoke adjustment to derive values for alpha is based on factor models: one single factor model and two multi-factor models. The single factor model looks at removing the return that can be explained by a single risk factor, a benchmark for the market constructed from the funds under analysis (Model 1). The multi-factor models look at removing the return that can be explained by more than one risk factor, first, simple sector exposures (Retail, Office, Industrial, Other) (Model 2) and, second, public market factors, represented by an EPRA index and a corporate-bond index (Model 3).

Using Model 1 over four five-year periods, the analysis shows that, in two of the four periods, top-decile funds delivered positive alpha in both the ranking and evaluation periods but that, in the other two periods, the evaluation periods showed negative alpha, i.e. on 50% of occasions the best risk-adjusted return funds became the worst risk adjusted-return funds. The picture was similarly mixed for those decile/quartile funds showing the most negative alphas. The question of persistence is clearly highlighted, i.e. positive alpha is achievable but is it persistent?

Looking at the 10-year periods, the authors do find evidence for persistence in alpha, both for the very best and the very worst funds. Over five-year periods only weak or no evidence of persistence can be found.

Using Model 2 over two, 10-year periods shows that positive alpha only occurs for the top-quartile funds, where alpha is 0.9% and 1.9% p.a. for the two periods. Interestingly, the worst risk-adjusted performing funds in the evaluation period subsequently become better-than-average, risk-adjusted performers in the following period.

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2.4.4 Attributes and predictability of performance and alpha

This section of the report is interested in the question of whether it is possible to identify top-performing managers, given that it appears that, in some instances, there is some persistence in performance and alpha. A number of variables are used to attempt to explain the levels of performance and alpha, such as the fund's structure and stock scores (from IPD's performance attribution), size, type of fund, specialisation of fund, development exposure, net investment and yield levels.

Looking at the two 10-year periods, the only positive factor that is statistically significant in explaining alpha is the property score (from IPD attribution analysis), i.e. risk-adjusted performance is positively linked to stock selection. The strongest negative influence on alpha in both 10-year periods is development exposure, although this is not statistically significant. Adding in the prior 10-year period's alpha as an explanatory variable confirms that there is persistence in alpha over the subsequent 10-year period but not in performance.

The ultimate question in the report is to ask whether it is possible to predict alpha or performance using the various explanatory variables. For the 10-year analysis, around 35% of the variation in fund alpha could be explained by the explanatory variables. The authors conclude that:

- "the equivalent yield of the fund in the earlier period is a significant predictor both of fund alpha and of fund performance in the following period"; and
- "IPD's structure score…is not predictive of future performance. This suggests performance from good sector allocations cannot be sustained in the longer term".

Over the five-year periods, the authors find that alpha and performance does not persist but that "the equivalent yield of a fund was found to be a consistent predictor both of fund alpha and of fund performance in subsequent five year periods". Such a finding may be time-dependent if that style of investing is beneficial over the analysis period only.

2.4.5 Implications

This report is a thorough look at the topic of persistence and alpha in UK property and the authors conclude that, "the evidence of alpha in UK property fund performance is limited".

Nonetheless, for those constructing an investment process the suggestions would be that, based on this research:

- time horizons for managers and investors should be relatively long since alpha was obtainable and persistent over longer time periods;
- stock selection should be emphasised since it appears more important in explaining alpha than structure;
- properties should be sought where the current yield over-compensates the investor for the longer-term risks they are taking as this is "an observed form of risk"; and,
- development should be considered very carefully since it has tended to be associated with negative alpha and performance.

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2.5 Risk Web 2.0. An Investigation into the Causes of Portfolio Risk (2011)

Gerry Blundell, Malcolm Frodsham & Roberto Martinez Diaz

2.5.1 Introduction

This report is the second[6] to look at the concept of 'Risk Webs', risk factors portrayed visually in a web shape, where each factor is shown as a difference to the average for a market benchmark. The report takes into account more influences than the original report and also considers portfolio risk scoring, an overall risk score and predictions of relative performance of property portfolios.

Risk can mean many things and, in Risk Web 2.0, risk is taken as being relative to a benchmark. In this way, the research is more concerned with the design of portfolios that have a market benchmark as a comparator than those that tackle risk in an absolute sense. A risk becomes any feature that is different to the average of that feature contained in the benchmark. This can also then be linked to the concept of tracking error, that is the volatility of the deviations in return from the benchmark return.

The authors note that it is important to think about risk in a forward-looking sense, since historical returns are linked to historical risks and how they were priced by the market at that time. Future returns will be the compensation for future risks at that time. Since property portfolios are constantly changing without any turnover, as leases naturally become shorter, leases are re-geared, leverage falls and rises, vacancy falls and rises, tenants leave and new ones arrive, etc., the features of risk within a portfolio will also be constantly changing. This is an important concept for either relative or absolute risk and the incorporation of risk factors into an investment process.

2.5.2 Risk factors

The first task in this research was to assess a variety of risk factors and to see which of these was most related to risk as defined in the study (i.e. return relative to the benchmark). The study considered a total of 43 potential risk factors and by looking at their relationship with future return differences from the benchmark identified those factors that were most relevant in determining risk.

The risk factors can be broken down into a number of groups:

- **Core risk factors** – this does not refer to investment style but to a set of four factors that might be considered core to risk, i.e. sector, region, segment and remaining lease length. Four different ways of measuring these four risk factors were used, resulting in 16 different potential core factors;
- **Stock concentration** – measures such as the percentage of the fund in the five largest assets or average lot size;
- **Growth-related factors** – measures such as relative equivalent yield or vacancy rate;
- **Income-related factors** – covenant strength or percentage of value in top 10 tenants, for example; and
- **Manager-activity related factors** – measures such as exposure to development, leverage, indirect vehicle exposure or capital expenditure.

[6] The first was carried out in 2003. See: https://www.researchgate.net/publication/247512486_Managing_Portfolio_Risk_in_Real_Estate.

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Using this array of factors, the research team looked to see which of these were most related to subsequent portfolio risk. Their tests resulted in 12 factors, nine 'evergreen' factors and three 'cyclical' factors. The evergreen factors were those that were important determinants of risk throughout the time period, whereas the cyclical factors were those that were influential from time to time and, in this case, most influential on the downside. The authors note that over longer time horizons the evergreen factors tended to increase in importance relative to the cyclical factors. The risk factors selected were:

- **Evergreen** – Region concentration, property type weighted by tracking error, property type concentration, remaining lease length concentration, percentage of portfolio in five largest assets, average lot size, relative equivalent yield, percentage value in top-10 tenants, total return in previous year; and
- **Cyclical** – development, covenant strength, vacancy rate

Amalgamating these factors into a model to predict performance the authors state that "they do not readily combine into a model that could be used for predictive purposes".

In addition to these factors, the study reports on the addition of indirect exposure as another factor and finding that, whilst this increases funds' risk, the factor itself is a not a determinant of risk. The suggestion is that another factor is at play and that this may be leverage.

2.5.3 Leverage as a factor

Before looking at leverage as an additional factor, it is looked at in isolation. The authors note that funds with relatively risky portfolios tend to add leverage in an attempt to enhance returns further and that the impact on returns follows the shape of a tick: where negatively leveraged funds (those holding cash) tend to perform better than those with low leverage and that, as leverage increases beyond 40%, the dispersion between individual funds' returns increase. They compare leverage to a volume knob that increases beta risk, except that, in the case of leverage, the volume knob can be turned negative by holding cash and portfolios can be de-risked. They note, however, that "not many funds availed themselves of this facility in 2008".

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Adding leverage to the explanatory factors to explain risk (deviation from benchmark return) tends to swamp the evergreen factors, making them far less important, and increasing the importance of the income factors. In this way:

> "Region and stock concentration are much less important, while covenant factors and relative equivalent yield of the portfolio become important. It would appear that the importance of these income factors is amplified by the application of leverage …
>
> "The analysis has highlighted just what an important factor leverage is, especially when values are contracting. Leverage, and especially leverage in excess of 40%, increases subsequent differences in return. Leverage, no doubt, adds to positive return differences on the upside and negative ones on the downside. Leverage also masks the direct asset risk factors, as it changes returns. Instead of the 12 factors identified … [in the original web], only the following are associated with increased risk to leveraged returns …:
>
> - Weighted portfolio beta of PAS[7] segments;
> - PAS segment concentration...;
> - Relative equivalent yield;
> - Previous year's TR[8];
> - Leverage."

Whilst the authors were able to create a model of returns that better explains the leveraged returns than the unleveraged returns, they note again that predicting leveraged returns using a model including these factors was not viable.

2.5.4 Implications

For those managing an investment process that considers risk relative to a benchmark, deviations in returns from that benchmark could be explained by a relatively limited number of factors and amalgamated into a scorecard. Whilst the factors do not explain relative risk completely, both the evergreen and cyclical factors could be influenced through time by the manager, though there are costs associated with this, not least the cost of trading.

The addition of leverage looks to require special attention as a factor in determining relative (and absolute) risk, since, when leverage is added to a portfolio, it tends to swamp factors that normally determine risk and increases the focus on other factors, particularly those around income. It was also found that relative performance in a downturn can be improved through the introduction of cash holdings but, for those holding leverage in a downturn, the dispersion of returns is increased. The findings related to leverage as a factor would suggest that an investment process designed to consider a leveraged fund might de-emphasise evergreen factors in favour of cyclical and income-related factors and, of course, the leverage itself.

These findings are, perhaps, intuitive but they highlight that the behaviour of portfolios is largely as one might expect. For those constructing an investment process, this puts the focus on understanding *a priori* factors that are likely to influence relative risk and to ensure that these are managed appropriately through time, since some factors tend to rise and fall in prominence, with some being swamped by the presence of leverage. The same could be said of investment processes designed to consider absolute risk.

[7] IPD/MSCI's Portfolio Analysis Service.

[8] Where TR is Total Return.

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2.6 Individual Property Risk (2015)

Paul Mitchell

2.6.1 Introduction

This report is concerned with the measurement and explanation of individual properties' investment risk. It is an extremely rich resource, delving not only statistically into the topic but also bringing alive the findings and issues through case studies of no less than 88 individual properties. The report looks at the implications of its findings for the pricing of individual assets and considers the difficult question of whether returns have compensated the owner for the risks taken. If this was not enough, the report also provides insights into how best to construct portfolios of assets and to control their risks.

In parts, the report is an update of Risk Reduction and Diversification in Property Portfolios (2007), and this section of the report is largely omitted from the discussion below. Here, the focus is on the level of risk in individual properties and the impact of various features on portfolio risk and alpha.

The report uncovers numerous findings that may be considered unorthodox, but they are backed up by rigorous analysis and ought to be taken seriously. As such, the report should be intriguing reading for those wishing to understand individual property risk and so how to think about an investment process that can take account of the findings of the report.

In particular, the report uncovers a factor, which it names "asset management intensity", as key in putting together portfolios and managing their risk.

2.6.2 Levels of risk in individual properties

The research draws clear distinctions between the different types of risks making up an individual property's risk:

1. Market risk – this is a systematic risk and each individual asset will be driven, to a greater or lesser extent, by the market – the measurement of this risk is called beta and a return should be earned for taking on this risk;
2. Factor risk – these are systematic risks that relate to common, but non-market, influences and a return should be earned for taking on these risks; and
3. Specific risk – these are risks that are unique to each asset and, through diversification, may be lessened or removed; if it is fully diversified away, it does not require a return; it is the risk that remains after accounting for the systematic risks.

In addition, the research also seeks to identify alpha, risk adjusted out or under-performance. Alpha exists where returns have been higher or lower than their risks justify.

The study uses statistical analysis to consider the systematic risks and adds case studies to consider specific risk.

Considering the sample of 859 properties, regressions of properties' returns against segment returns show that, on average, the majority (63%) of returns can be explained by the market with many betas close to one. Around 70% of betas are between 0.8 and 1.2 but, correspondingly, 30% of betas are outside this range. To explain the varying betas, a number of variables are found to be useful: capital value, new leases, number of tenants, 10 years or more unexpired term, yield and whether or not the asset is a City office.

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Interestingly, 10% of the properties had no statistically significant relationship with the market, i.e. they did not provide a property-like return. Examples of such properties were found across all segments but ground rent properties, small lot sizes and those in the 'other' segment were disproportionately represented.

When considering factors, the research finds that "few properties behave like and experience risk like their type". This means that factors that may theoretically drive returns rarely actually do so. One factor found to influence returns was the prior year's gilt return with longer-leased property being sensitive to this.

Since factors are found to have negligible impact, the remaining 37% of the total risk in the dataset is attributed to specific risk. Specific risk tends to be greater for those properties having fewer tenants, relatively high yields, new leases during the analysis period and higher refurbishment expenditure. Also, specific risk tends to increase as lease expiry nears. It is notable that rent levels (a proxy for a quality building and/or location) seem to have no effect on specific risk, nor does tenant covenant quality. Overall, however, there is little explanation for the specific risk such that the specific risk remains idiosyncratic.

Looking at specific risk over time provides greater insight. The research was able to identify a number of systematic influences over specific risk, namely:

- Lease events;
- Vacancy;
- Yield;
- Unexpired term; and, from time to time,
- Lot size.

Of particular interest are those properties having persistently high specific risk, 18% of the sample, and those having one-off high specific risk, a further 4% of the sample. Of the former type, these are typically small lot sizes with unknown tenants, high yields, short unexpired terms and high capex. They are also disproportionately represented in the South East office and London office market segments. Of the latter type, whilst some general characteristics of these properties could be identified, those characteristics do not appear to be distinct from the sample. For both types of property having high specific risk, ground rents are overly represented, given their lack of link to the broader property market.

The research conducted 80 case studies into the high specific risk properties and found that the events surrounding high specific risk were all asset management-related, with 'change of use' being the feature that had the highest impact. The analysis also found that, whilst many asset management events had strong positive impacts, at some points in time they could also have strong negative impacts. The author concludes that:

> "management intensive properties – i.e. those routinely exposed to the leasing market and to refurbishment expenditure - have the highest levels of specific risk. Such properties' risk is also accentuated by their relatively high betas, something that partly reflects the dynamic of sentiment in the run-up to lease events and in response to their outcome and similarly with respect to asset management initiatives".

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2.6.3 Alpha

As a reminder, alpha is the risk-adjusted out or under-performance of an asset. Alpha can be positive or negative but, when discussed, it is usually implicit that commentators believe alpha is always positive.

In the sample of properties studied here, after adjusting for market risk, the average alpha was +1.1%. The author notes that this implies that properties not in the sample, but in the market, must have had correspondingly negative alpha and, it should be noted, neither the asset nor market performance were adjusted for fees. Whilst the alpha was positive at 1.1%, most properties had alphas close to zero and not statistically different from zero.

Looking at those assets with high (positive or negative) alpha, the following conclusions could be made:

- Smaller lot size properties, with a large number of tenants, characterised those with negative alpha;
- High capital expenditure is also linked to negative alpha;
- Larger properties, with relatively long unexpired terms, tend to have positive alpha; and
- Central London retail assets tend to have positive alpha.

2.6.4 Portfolio risk

The initial part of this section updates the earlier Risk Reduction and Diversification in Property Portfolios (2007) research referred to earlier. It holds some interesting findings, since the earlier research reported market risk of just 4.9% and this later piece of research now identified it as 12.7%. In this study, the average single-asset portfolio had a volatility of 16.7% and the average portfolio of just 20 assets was able to lower portfolio risk to 12.8% – almost entirely removing specific risk. This is because the riskiness of individual properties had been more highly correlated with that of the market.

The research also showed that there was a high level of dispersion of portfolio risk across portfolios of the same size. Looking at the 25th percentile portfolio, one carrying just 10 properties was able to deliver a return much lower than the average 600-asset portfolio. How is that possible? Such portfolios tended to hold assets that had low betas, low yields and low specific risk.

The report also has interesting findings related to 'style' portfolios. The report demonstrates this with reference to a high yield style. Since these properties carry high specific risk, the number of properties that are required for a portfolio of them to have a high correlation with the market of high-yielding properties is also high; a correlation of around 0.6 being achieved with 20 properties and the addition of a further 130 taking the correlation to around 0.85 for the average 150 property portfolio.

Another interesting finding relates to single-let versus multi-let properties. The intuitive answer to the question of which type of property lowers risk more quickly is that it is multi-let properties. However, simulating portfolios of single versus multi-let properties finds that this is not the case even though the risk of a single, single-let property is typically higher than a single-multi-let property. This seemingly counterintuitive result arises because multi-let properties are typically large and have high betas relying, typically, on high capital expenditure and dealing with numerous lease events.

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Finally, the research considered the biggest drivers of portfolio risk in the research, namely those properties with low specific risk and those with persistently high specific risk, 'stabilised' and 'asset management intensive' properties. These types of portfolios, "represent strong criteria for structuring portfolios and are far superior to other criteria, such as yield and size … Identifying in advance those properties likely to fit such criteria would represent a valuable element of the asset management process and a powerful classification in defining investment strategy." The research found that:

- Portfolios of stabilised assets can achieve diversification rapidly, with as few as 10 properties, whereas portfolios built from asset-management intensive properties took around 40 properties to get to the same position; and
- "Reflecting in particular the detrimental influence of high capital expenditure, 'asset management intensive' properties on average recorded negative risk-adjusted returns over the 10 years to 2013. Such properties have not delivered the returns commensurate with their risk".

2.6.5 Implications

This report has so many implications for the design of an investment process that it is difficult to draw out the potentially most important factors. Amongst them, however, there are a number of findings that should be of great value in the design of an investment process, assuming that they themselves are persistent.

First, and on average, the vast majority of portfolio risk could be explained by the market and it proved relatively straightforward to build portfolios that had a similar total risk (though, note, it was harder to build portfolios that have a beta of one and a tracking error of zero).

Second, there were properties that displayed high specific, one off or persistent risk. These properties were typically 'asset management intensive' and constituted a style of investment that, during the period of analysis, at least, failed to deliver positive alpha. More properties were required to diversify portfolios using such properties.

Third, multi-let properties, whilst individually less risky on average, combined poorly into portfolios, with single-let properties delivering lower portfolio risk relatively rapidly.

Fourth, not risk adjusting performance can give misleading results. A portfolio that underperforms the market may have done so by carrying lower risk properties. Analysis may show that the portfolio actually generated positive alpha whereas, superficially, a portfolio showing a return less than the market could quickly be branded a poor performer. The opposite is also true. This is important for not only the design of an investment process but the communication of the aim of the investment process: is the aim to outperform the market regardless of risk; hit a target return with the lowest possible risk; or deliver risk-adjusted outperformance.

Finally, and linked to the last point, "low risk properties should be priced to under-perform an All Property benchmark. Corresponding to this, performance attribution should recognise the underpinnings of such under-performance and not label it as 'poor' stock selection. Similarly, out-performance in high risk properties should not necessarily be attributed to 'good' stock selection".

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2.7 An Investigation of Hurdle Rates in the Real Estate Investment Process (2017)

Norman Hutchison, Colin Lizieri, Bryan MacGregor, Nick Mansley, Rachel Portlock, Rainer Schulz & Yuan Zhao

2.7.1 Introduction

This report asks questions that are central to an investment process and the quantitative aspects of decision-making within it. The report considers the nature and extent of the gap between theory and practice when making investment decisions and, in passing, provides a useful comparison with other industries. It does this by reviewing the literature on how financial decisions should be made and then, through surveys, interviews and focus groups, looks to uncover how decisions are made in practice.

As such, this report is important to those constructing and operating an investment process as it has the potential to improve decision-making. Here, some of the key findings of the research are discussed and their implications. As discussed at the outset of this report, it is not possible to outline every result or finding and some important findings will be left behind. This report is one where some important findings have been left behind in favour of better articulating those that are included. In particular, findings regarding scenario analysis and simulation work are excluded.

2.7.2 How should decisions be made?

The researchers reviewed a substantial quantity of literature to be able to answer this question and summarised the 'advice' from the literature as it applies to three different investment types:

1. 'Core' investments, where the ability to influence future cashflows is relatively limited;
2. 'Value-add' or 'opportunistic' investments where there are substantial potential options in the future to influence the cashflow, ; and,
3. Investments where the future cashflow is tied not only to the investment under consideration but also tied tightly to the actions of others.

For Type 1 decisions, the authors state that:

> "The literature is clear that for 'core' investment projects, the Net Present Value (NPV) should be used as the approach for investment decision-making. This requires an estimation of the expected future net cashflows and a discount rate (hurdle rate) to be applied to those cashflows – to derive the present value – and then the subtraction of the initial investment to derive the NPV. Brealey et al. (2007)[9] state that the NPV is "the 'gold standard' of investment criteria"; it is the "only criterion necessarily consistent with maximizing the value of the firm [and] provides the proper rule for choosing among mutually exclusive investments" … IRR is never a better investment criterion than the NPV, and at times a worse one."

With the use of NPV, the decision as to whether to invest is relatively straightforward as the NPV must be positive.

[9] Brealey R.A., Myers S.C. and Marcus A.J. (2007). Fundamentals of Corporate Finance. 5th Edition, McGraw-Hill, New York.

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The authors state that the hurdle rate itself should be set as the Weighted Average Cost of Capital (WACC) of the firm or, in the case of non-traded vehicles, the weighted average of the cost of equity and debt. The literature warns against the use of 'fudge factors' to derive the hurdle rate, since managers are typically not good judges of the probabilities attached to downside cashflow scenarios.

For Type 2 decisions, the literature advocates not only the use of NPV as a decision criterion but, where appropriate, a real-options approach. This is because value-add and opportunistic type investments offer optionality around cashflows and the best way to assess the value of these is through option pricing. The literature notes that this approach is rather complex however.

For Type 3 decisions, where the decisions of others are likely to change the cashflows on a project, the literature advocates the addition of game-theory approaches to decision-making.

2.7.3 How are decisions made?

The research divided its questionnaire survey, interview and focus groups into three areas. These are discussed in turn below.

1. Processes and Responsibility

The authors found that most organisations used a formal investment committee to process decisions. They found a number of tensions within that construct:

- investment and fund managers typically sought discretion whereas researchers and risk managers typically sought consistency and validation of inputs;
- the 'need for speed' to execute a decision and the requirement for a formal process; and
- deals being approved based on non-formalised decision rules, i.e. not satisfying the investment criteria but being executed for other reasons.

2 Decision methods

95% of survey respondents replied that they used a hurdle rate, in some form, to make an investment decision. The most frequently used decision tool was IRR, with 93% of respondents putting this as one of the top-three metrics that they used (with NPV used by 46%), whilst real options pricing was the least frequently used investment decision tool (14%). Clearly, both results are a surprise since, given the theory, it would be expected that NPV and real options were utilised far more often. In the case of NPV versus IRR this would be expected as NPV is cited as a superior investment decision-making tool, and, given the general industry practice of 'active asset management', or Type 2 decisions, a greater use of real options would have been expected.

3 Hurdle rates

The first distinction that was found in practice was the use of absolute or relative hurdle rates. Absolute hurdle rates were most commonly used by Principals (REITs, endowments, major pension funds) and relative return targets by Agents (i.e. investment managers managing an allocation of capital on behalf of an investor).

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For the first group, the Principals, the report states that "textbook models based on costs of debt and equity were conspicuous by their absence". The predominant approach to deriving the hurdle rate was a risk-free rate plus a risk premium rather than the WACC approach. There were variable approaches to both the derivation of the risk free rate (nominal, real, short-term, long-term, etc.) and to the risk premium (a single rate for all assets, given through a 'house view', adjusted for each individual property subjectively or through a formal process, etc.).

For the second set, the Agents, hurdle rates were set with reference to a benchmark (externally determined by the client) and relative return forecasts. These, sometimes adjusted for individual assets' locations or features, then formed the hurdle rate for the investment. The authors note that, "hurdle rates for "fund management" type organisations are usually determined externally by the demands of clients, the actions of competitors and the weight of capital relative to the investment vehicles available in the market. Where this is not the case, they typically used a 'risk-free rate plus risk premium' approach."

2.7.4 Implications

This report discusses theoretical and practical aspects of decision-making in property investment, focussing on the use of hurdle rates and how these are incorporated into decisions. This question is at the heart of property investment processes and the findings suggest that sub-optimal decisions may be made with four clear sources.

First, the decision metrics used most commonly in practice are not generally recommended in theory as the best approach. The literature was clear that NPV should be used in the first instance, with additional real-options and game theory approaches added depending upon the extent to which the potential investment can be influenced internally (options around the cashflow) or externally (by others influencing the cashflow by something that they do). The authors do not concern themselves with this per se but are concerned that this may show a general lack of sophistication across the industry and, potentially, a skills gap.

Second, the derivation of the hurdle rate was predominantly through a risk-free rate plus risk premium approach and not through a WACC approach.

Third, a lack of knowledge and/or skills regarding real options and game theory may be impacting investors not using these approaches as part of their decision-making process.

Fourth, the decision-making bodies, typically an investment committee, were found to have a degree of 'tension' within them. This may be inevitable, or it may be possible, through clearer setting of the remit and rules of engagement, to enhance the effectiveness of the investment committee as part of an investment process.

Perhaps more disturbing though are the final conclusions to the report that:

- "The peculiarities of real estate appear to be used as a justification for gut feel and judgement rather than alongside detailed and rigorous analysis.
- There does not appear to be a well-developed culture of learning and analysis and this is an area the researchers believe the industry should seek to address".

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2.8 What is Fair Value? (2015)

Ben Burston & Andrew Burrell

2.8.1 Introduction

This is the only report from the IPF's Short Papers Series included for review in this study. The Short Papers Series addresses current issues facing the property investment market in a timely but robust format. Whilst it appears in this format, the question of fair value is one facing those designing investment processes, since understanding fair value helps to decide whether markets, sectors, segments and properties are good value in comparison to others or in an absolute sense.

Whilst much of the paper is a rehearsal of then-current themes in the market (in line with the aims of the Short Paper series to consider current questions in a timely fashion), the paper is notable for its reference to, adaptation and use of the Nobel Prize winning research of Robert Shiller[10]. This work saw the derivation of the 'Shiller PE' or CAPE (Cyclically Adjusted Price Earnings) ratio, a metric more often associated with the analysis of equity markets. Shiller's work on speculative asset prices and his 1981 paper, *Do stock prices move too much to be justified by subsequent changes in dividends?*, lends itself neatly to the question of fair value in property.

Some elements of this Short Paper can be seen in another IPF report, *Long-term Value Methodologies in Real Estate Lending*, which is discussed later in this study.

2.8.2 Fair value and the CAPE

Property investors are used to discussing yields but they are, typically, not used to discussing price earnings ratios, even though one is essentially the inverse of the other. One market where the usual discussion tends to be more along price/earnings lines is that of Germany, which has a history of discussing 'the multiplier'. Germany also has more history of looking at the 'sustainable valuation' of properties rather than the more market-oriented approach to valuation used elsewhere.

The CAPE ratio is exactly as it describes itself. It is the ratio of price to earnings (PE) where the earnings has been cyclically adjusted (CA) to alter the impact of current earnings on that ratio (i.e. it lessens the impact of where the market currently is in a cycle) and, both prices and earnings are adjusted for inflation. The earnings used are backward-looking and are usually taken over the last 10, or sometimes five, years so as to look across a cycle. The CAPE ratio is not a predictive tool but an indicator of whether prices are high or low compared to an average of the indicator itself, which is deemed 'fair value' in this context.

Very long histories of the CAPE ratio can be constructed in equities but this is not as straightforward for property. Also, since the 'P' in CAPE stands for prices construction of the CAPE ratio, for property this is more of a 'CAVE' ratio since 'V'aluations are substituted for 'P'rices. Valuations could be unsmoothed to provide a proxy for prices but the authors do not do that here.

[10] The paper also uses a more orthodox property-related model to consider fair value based upon forward-looking relative value, which will not be discussed here since these models have been prevalent in the industry since the late 1980s and continue to be used broadly.

2. REPORTS

The study's constructed CAPE ratio begins in 1991 and ends in 2014. The average of the CAPE ratio for the UK property market as a whole over the entire period is around 18, in line with a yield of around 5.6%. A chart showing the history of the CAPE ratio demonstrates that, if a deviation from average of one standard deviation is used, resulting in a fair value range from around 14 to 22, then UK property exhibited a period of over-pricing between 2003 and 2007, in the run up to the global financial crisis and, subsequently, a period of under-pricing from 2008 to 2013. In 2014 the CAPE ratio was in the fair value range for All Property.

The authors go on to look at a variety of sectors and segments of the UK property market. These showed that:

- City of London Offices, South East Offices and Rest of UK Offices, had a fair value CAPE ratio of around 15 in 2014, sitting within the fair value range for all of the segments, and,
- West End of London Offices, with a fair value CAPE of around 17 in 2014, sitting above the fair value range, indicating over-pricing at a level similar to that seen in 2007.

2.8.3 Implications

Property investment processes have tended to be designed around a concept of forward-looking relative value, reliant upon forecasting economic, property and other asset class variables. The CAPE ratio analysis presented in this paper does not rely upon forecasts but is based upon history. It makes no predictions but provides an indicator of fair value and when markets depart from fair value.

For those designing an investment process, measures such as the CAPE ratio could be an alternative or companion to a process based upon forecasts.

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2.9 Long-term Value Methodologies in Real Estate Lending (2020)[11]

Nick Mansley, Colin Lizieri, Zilong Wang, Neil Crosby & Steven Devaney

2.9.1 Introduction

This ambitious project, with serious implications for the functioning of the UK property lending market and systemic financial risk as considered by the Bank of England, is the only research considered in this review that deals with valuation in the context of lending. It is important for any investment process that includes lending to property and could be applied more broadly than lending, as it is closely linked to the concept of 'fair value'.

The report is the culmination of a relatively long history, starting with the Property Industry Alliance's report of 2014, which, amongst its key recommendations, included to:

> "Use long-term value measures for risk management: For CRE [Commercial Real Estate] lenders subject to regulatory capital rules, loan-to-value (LTV) based capital requirements should be linked to a long-term measure of collateral value".

The IPF report also builds on work carried out in 2017[12], which considered Investment Value (IV) and Adjusted Market Value (AMV), two existing approaches to looking at long-term value for secured lending.

Such long-term valuation methodologies have, at their foundation, the idea of a 'fair value', that is a value that can be justified by fundamentals rather than one that is justified by markets at a particular point in time. The idea of the research is to try to identify "measures that may indicate when the probability and scale of potential falls in commercial real estate values is high", the aim being to "send a powerful signal when the market is overvalued or prone to correction"[13].

During the course of the research, the team ended up considering a number of factors not set out in the original brief, without the consideration of which it would have been difficult to satisfy the original aims of the study. Important as they are, they are not considered here and the focus is solely on the long-term valuation methods.

[11] At the time of writing, only the Summary Report of this research was available.

[12] IPF (2017) Long-term valuation methodologies and real estate lending

[13] The original intention of the 2017 report was to construct a measure to replace pro-cyclical market values with long-term values against which lenders would lend. This would require a model of long-term value at the individual property level. This original intention was abandoned and the 2020 report only considers the long-term value question at market/sector/segment level.

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2.9.2 Methodological issues

In order to produce a robust framework for the analysis of long-term value, the authors point to several methodological tests that should be satisfied by the selected metric or metrics. These are important and provide clarity as to why the approaches eventually selected were selected. The following section is extracted directly from the 2020 Summary Report, as it neatly summarises the issues.

"Approaches to long-term value should:

- Have an economic logic (can recognise a change in the underlying drivers) – for example, a fall in real interest rates should normally be reflected in lower cap rates (and lower required returns) for real estate.
- Recognise that past trends and coefficients are sensitive to the estimation window (time frame of the trend data) and the impact of what period is chosen to estimate relationships or trends needs to be explored. Long-term trends based on 'anchored' windows will tend to be more stable than those based on 'rolling' windows but 'anchored' windows will be more insensitive to structural changes.
- Avoid the use of pro-cyclical market rents or rental forecasts – whilst underlying demand and supply may support higher rental levels in the upswing of a cycle, any estimates or methodology for long-term value should try to avoid projecting forward the short-term momentum that occurs in rental cycles. … Approaches to sustainable rent that are based on relationships between the overall economy and supply are likely to provide a more robust outcome.
- Be aware of the potential impact of compositional changes: the coverage of the market by the different data providers has changed over time with a reduction in London office coverage as a result of increased ownership by international investors.
- Be tested for robustness in a way that recognises the limitations of the data and that there have been only two major downturns in the past 40 years. It should be noted that the study is not looking for an approach that accurately tracks the market but, rather, for something that sends a powerful signal when the market is over-valued or prone to correction."

With these methodological issues clear, the authors set to work to identify the components of such a long-term indicator of value by considering rental values and capitalisation rates separately, before combining these to consider capital values. Throughout, they test the 'signalling capability' of each metric.

2.9.3 Rental values

The identification of a sustainable rental value is the first step in identifying levels of long-term values. The report looks at four alternative models of sustainable rent and uses three alternative data sources for the data on rent: MSCI, JLL and CBRE, though results are only shown for the JLL data. It should be noted that, unlike many modelling exercises, the aim is not to maximise the fit of the model to the data but to extract the underlying signal from the data. The models that are used and a brief description are as follows:

1. Average value – simply the average value of the rent;
2. Trend value – simply the trend value of the rent, predicted forward;
3. Econometric model – a model using demand and supply-side variables to estimate a model of sustainable rent and to make predictions of it; and
4. Econometric model, using trend inputs – a model using trends of demand and supply variables to estimate a sustainable rent and to make predictions of it.

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The results from variations in these models are used to estimate a series of sustainable rents for each set of source data and then to infer corrections from market rents over a five-year period. Model 1, average value, is not considered tenable so only results of Models 2, 3 and 4 are presented. The authors conclude that the best model, in terms of predicting subsequent corrections in rents, is Model 3, the econometric model, using demand and supply data.

2.9.4 Capitalisation rates

The second step in identifying a long-term value is to consider at what rate the sustainable rent should be capitalised. The models tested are similar in construct to those used in the identification of a model for sustainable rents and are as follows:

1. Average value – applied to levels or gaps between the level and the risk-free rate;
2. Trend values – applied to levels or gaps between the level and the risk-free rate;
3. Econometric model – a model using bond yield and rental-growth expectations; and
4. An ex ante econometric model – a model using estimates of where certain variables should be, rather than where they are, including bond yields, risk premia and rental growth.

The authors argue that, unlike for rents, Model 1 has some underlying logic, but Model 2 does not as predictions will simply continue trends towards or away from zero. Again, the models are tested across all three data sources but only results for the JLL data are shown.

The results from variations in these models from actual capitalisation rates are used to infer subsequent corrections in capitalisation rates in the same way as for rents. In the case of capitalisation rates, there is no single preferred model, statistically speaking, so the authors opt to prefer Models 2 and 3, based on econometrics, since these models have some underlying economic logic to them, as opposed to Model 1, which does not.

2.9.5 Capital values

Through the combination of the preferred models it is possible to arrive at the goal of long-term values that may be used as a signal to flag markets, which are somewhat stretched away from where the models would suggest they should be, indicating a higher than average probability of a subsequent correction, though not making an explicit projection of one. In this case, the authors test three models, again across the three data sources, though results are only shown for the JLL data:

1. The AMV approach, which was used in the 2017 report;
2. Econometric models for both rent and capitalisation rate (in both cases Model 3); and
3. Econometric model for rent (Model 3) and ex ante econometric model for capitalisation rate (Model 4).

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The authors conclude that:

> "… approaches that build on an underlying economic logic in determining 'sustainable' rental values, yields and capital values appear to have some measure of success in indicating likely market corrections, and overcome the critique of the AMV approach that it has no underpinning economic basis. However, none of the models identify all of the cyclical changes and the results are less robust at sector level than aggregate market level. Furthermore, there is no real objective way of determining what level of deviation of price from sustainable value constitutes a warning signal, nor do the models predict the magnitude or precise timing of any correction. As a result, such measures may be best used as one of a number of indicators that real estate values may be at heightened risk of a significant fall."

2.9.6 Implications

The implications of this work for investment processes are, potentially, considerable notwithstanding the authors' caveats. Considering first processes related to providing debt, the use of a long-term value in the process would highlight when the overall market is at risk of correcting and so potentially encourage an increase in underwriting standards and potential lower LTV loans, given the risk that 'V' may correct. This is important, not just for investment processes but for those with oversight of financial stability.

In the same way that the use of long-term metrics may be useful for lending, those managing equity may find it valuable to alter the way in which they invest if there are strong signals that indicate a potential future decline in values. Markets can continue to defy gravity for some time of course and those decreasing risk towards a peak would need to satisfy themselves and their clients that they are content to operate such risk management procedures when the market, and other participants in it, are not.

The incorporation of long-term valuation metrics into both debt and equity property investment processes has the potential, if utilised industry-wide, to lessen the chances or extent of speculative bubbles. The degree of self-control necessary for that to happen may be too great, however, and so regulators may need to offer a helping hand.

3. CONCLUSIONS

Introduction

This report has outlined a number of research papers that exemplify the tradition of the IPF's industry-funded Research Programmes since 2003. For each, it has highlighted how they may influence an investment process and the design of that process. Some of the research is relatively dated but could still have an impact on how an investment process is developed. Some of the research is relatively new and may have an immediate impact.

The role of research within organisations may be to translate the findings of research into practice and to extend and adapt the research to fit within an organisation's aims. Whatever the results and implications, it is clear that a substantial body of innovative and potentially impactful research has been carried out and that the industry should take note and utilise it to whatever extent possible.

To what extent the research has been integrated into day-to-day business and investment processes is a topic worthy of study in itself.

3.1 Implications for an investment process

The implications of the research discussed here on an investment process are too numerous and detailed. Nonetheless, what should be said is that, by drawing out some of the key findings of the research, it is possible to see the potential influence such findings could have on aspects of an investment process, whether it be the consideration of depreciation, the construction of a portfolio, the measurement-of risk-adjusted returns or the generation of alpha.

A measure of research's impact is the potential to change the way in which things have been done historically and the studies here certainly have that potential. As more research is produced, it is worthwhile looking back at older research to see what may have been missed and what may not have been implemented in practice already. It is all too tempting to part-read a report, attend a presentation, and move forwards. Unfortunately, to make research have an impact it is only through a thorough reading and re-reading of a report that it will be possible to glean the true potential impact of it. Then, of course, the findings need to be integrated into an investment process.

This review has drawn out a set of reports, which, when taken alone, have numerous findings that could be incorporated into an investment process. Taken together, the research that has been identified here as making key contributions to an investment process has created a risk web all of its own: it is possible to see themes emerging from the reports' findings, themes that link all of these reports together to some extent. Those key themes are:

- Depreciation and capital expenditure – drivers of net income growth;
- Asset management intensity – portfolio construction and return expectations;
- Risk-adjusted returns – alpha, persistence, performance measurement;
- Leverage – its impact on property-level drivers of risk; and
- Long-term valuation – as an anchor for decision-making.

One over-arching implication can be drawn: that it is possible to make sub-optimal decisions as a result of the array of information needed, the uncertainty surrounding each piece of information and the way in which a decision may be made.

3. CONCLUSIONS

3.2 Further research

As with any review of existing research, it is inevitable that gaps or extensions to the research are found. A few of these are highlighted here:

- Within the context of depreciation, there remain a number of unknowns. One potentially useful angle would be to consider the optimal level of capital expenditure on an asset and to relate this to observed depreciation, the only element of depreciation that can relatively easily be measured.
- Within the analysis of the consensus forecasts produced by the IPF on an ongoing basis, two elements appear to be missing, namely turning point error analysis and segment ranking analysis. It would be useful to understand the ability of the consensus, or of individual forecasters, to predict turning points and to rank segment performance correctly in advance. If possible, both features could potentially add value to an investment process. It would also be interesting to look at whether there is herding around publicly available or paid for forecasts.
- There has been little work into the psychological, both individual and group, factors that are at play in decision-making, typically at a formal investment committee, though two papers discussed here (in sections 2.3 and 2.8) touch on this. An analysis of decision-making, through informed observation, would be a valuable addition in identifying biases and behaviours that may result in sub-optimal decision-making.
- The work contained in the papers discussing the presence of alpha would be worth repeating on a regular basis. This could be tied into exploring how better to measure risk-adjusted performance and to integrate this into an investment process.
- Two pieces of research highlighted here look at longer-term measures of value, one through CAPE and one through econometrically-based measures. It would be useful to study how and whether such methods might be integrated into both debt and equity decision-making at the individual asset level.
- The work presented on 'risk webs' is, by its nature, based on relativities. It may be useful to consider how such work might be adapted to look at risk on an absolute basis.
- Further research into the impact of leverage on other drivers of return would seem valuable since leverage in a portfolio appeared to swamp the risks in a property portfolio.

APPENDIX[14]

Investment Property Forum Research Catalogue

2003-2006 - The following research projects were funded through the IPF and IPF Educational Trust Joint Research Programme 2003-2006, some with additional partnership funding

- Liquidity in Commercial Property Markets - Research Findings (April 2004)
- Opening the Door to Property: Assessing the Needs of Small Investors in Property (September 2004)
- Depreciation in Commercial Property Markets (July 2005)
- Investment Performance and Lease Structure Change in the UK (July 2005)
- The Size and Structure of the UK Property Market (July 2005)
- Disagreement and Uncertainty in UK Property Market Forecasts (January 2006)
- Institutional Investment in Regeneration: Necessary Conditions for Effective Funding (May 2006)
- The Investment Performance of Listed Office Buildings (May 2006)
- Pricing Property Derivatives: An Initial Review (September 2006)
- Property Stock Selection: Organisation, Incentives and Information (November 2006)
- The Sustainable Property Appraisal Project (November 2006)
- Risk Reduction and Diversification in Property Portfolios (February 2007)
- Index Smoothing and the Volatility of UK Commercial Property (March 2007)
- Asset Allocation in the Modern World (July 2007)
- Planning Policy and Retail Property Market Performance in English Towns and Cities (October 2008)

[14] Underlined studies are reviewed in this report.

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2006-2009 Research Programme

- The Use of Periodic Valuations in Indirect Property Investment (June 2007)
- The Energy Performance of Buildings Directive and Commercial Property Investment: A Situation Review (September 2007)
- Large-scale Investor Opportunities in Residential Property: An Overview (November 2007)
- Risk Management in UK Property Portfolios: A Survey of Current Practice (December 2007)
- Loan Default Pilot Study (March 2008)
- Alpha and Persistence in UK Property Fund Management (April 2008)
- Implication for the Strategic Development of UK REITs from the Experience of LPTs in Australia (April 2008)
- Retail Investor Attitudes to Commercial Property Investment (May 2008)
- Costing Energy Efficiency Improvements in Existing Commercial Buildings (January 2009)
- Demand for Sustainable Office Buildings in the UK (May 2009)
- Real Estate Investment Trusts: The US Experience and Lessons for the UK (May 2009)
- Greening Leases – The Landlord and Tenant Relationship as a Driver for Sustainability (August 2009)
- The Treatment of Covenant Strength by the UK Property Industry (August 2009)
- Urban Regeneration: Opportunities for Property Investment (August 2009)
- ISPI (UK): Creating a Sustainable Property Investment Index (October 2009)
- Depreciation of Office Investment Property in Europe (March 2010)
- UK Institutional Investors: Property Allocations, Influences and Strategies (July 2010)
- Risk Web 2.0 An Investigation into the Causes of Portfolio Risk (March 2011)
- Property and Inflation (April 2011)
- Depreciation of Commercial Investment Property in the UK (November 2011)
- Real Estate's Role in the Mixed Asset Portfolio: A Re-examination:
  - Real Estate Returns and Financial Assets in Extreme Markets (May 2012)
  - Time Varying Influences on Real Estate Returns (April 2012)
  - Private Commercial Real Estate Returns and the Valuation Process (April 2012)
  - Real Estate Returns and Other Asset Classes: A Review of Literature (April 2012)
  - A Re-examination Summary Report(March 2012)

[14] Those studies that are underlined are reviewed in this report.

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2011-2015 Research Programme

- Costing Energy Efficiency Improvements in Existing Commercial Buildings (October 2012)
- The Future of Property Forecasting (November 2012)
- Reassessing the Accuracy of UK Commercial Property Forecasts (November 2012)
- The Role of Commercial Property in the UK Economy (March 2013)
- Modelling Causes of Rental Depreciation for UK Office and Industrial Properties (June 2013)
- Returning to the Core: Rediscovering a Role for Real Estate in Defined Contribution Pension Schemes (October 2013)
- The Size and Structure of the UK Property Market 2013: A Decade of Change (March 2014)
- Liquidity in Commercial Property Markets:
  - Time to Transact: Measurement and Drivers (September 2014)
  - Estimating Liquidity in Real Estate Markets - Literature Review (February 2015)
  - Liquidity Pricing of Illiquid Assets (February 2015)
- Prospects for Institutional Investment in Social Housing (February 2015)
- Individual Property Risk (July 2015)
- Unravelling Liquidity in International Commercial Real Estate Markets (March 2016)

2015-2018 Research Programme

- Real Estate Solvency II 2017 Update (March 2017)
- The Changing Sources of Real Estate Debt Capital: Facts and Implications (May 2017)
- An Investigation of Hurdle Rates in the Real Estate Investment Process (May 2017)
- Costing Energy Efficiency Improvements in Existing Commercial Buildings (October 2017)
- Residual Land Values: Measuring Performance & Investigating Viability (April 2018)
- Managing Currency Risk in International Real Estate Investment (April 2018)
- Real Estate Investment in UK Defined Contribution Pension Schemes (May 2018)
- Current Practices in Benchmarking Real Estate Performance (September 2018)
- Occupational Drivers of Investment Performance in the Logistics Sector (April 2019)
- Long-term Value Methodologies in Real Estate Lending Summary (February 2020)

2018-2021 Research Programme

- Chopping Shopping? Implications of Structural Change on Sector Allocations in Investment Portfolios (December 2019)
- Global Capital Flows in a World Of Increasing Nationalism & Protectionism (December 2019)
- UK Residential Investment & Attitudes Survey (December 2019)
- Property Ownership in a Flexible World (February 2020)

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Short Papers Series

- UK Real Estate Debt: Problem for the Borrowers and the Banks (July 2009)
- The IPF UK Consensus Forecast and the Returns Implied by Property Derivative Pricing: Evolution, Record & Influence (August 2009)
- Issues in Property Investment Valuation (October 2009)
- Repricing Property Risk (November 2009)
- The Robustness of Property Income (November 2009)
- Real Estate Debt - an update (January 2010)
- The Evolution of the Market for Indirect Investments in Commercial Property (February 2010)
- Break Clauses – Who Holds the Risk in your Rental Income? (November 2010)
- Rent Reviews – Revolution or Evolution? (November 2010)
- A Review of the Current State of the UK CMBS Market (February 2011)
- Prepack Administrations and Company Voluntary Arrangements (February 2011)
- Property Banking Forum: Lending Intentions Survey 2011 (March 2011)
- Property Banking Forum: Outlook for Development Finance (October 2011)
- The Outlook for UK CMBS (November 2011)
- Implications of the Eurozone Crisis for the UK Real Estate Market and UK Investors (June 2012)
- Institutional Attitudes to Investment in UK Residential Property (June 2012)
- A Decade of Fund Returns (July 2012)
- Constructing an Effective Rental Value Index (January 2013)
- Implications for Property Yields of Rising Bond Yields (June 2014)
- Zombies and Beyond: A Further Update on UK Real Estate Debt (September 2014)
- Residential Investment in International Markets (November 2014)
- A Review of Interest Rate Hedging Strategies (January 2015)
- What Constitutes Property for Investment Purposes? A Review of Alternative Assets (February 2015)
- Implications of a UK Withdrawal from the EU: A Discussion Paper (April 2015)
- What is Fair Value? (April 2015)
- Pricing Retail Space (June 2015)
- UK Development Finance Review (September 2015)
- Emerging International Real Estate Markets (December 2015)
- Defining Investment Quality (January 2016)
- Real Estate Crowdfunding: Gimmick or Game Changer? (November 2016)

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