IPF Research Programme

An Investigation of Hurdle Rates in the Real Estate Investment Process

MAY 2017

FULL REPORT

This research was commissioned by the IPF Research Programme **2015 – 2018**

This research was funded and commissioned through the IPF Research Programme 2015–2018.

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:

An Investigation of Hurdle Rates in the Real Estate Investment Process

Report

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An Investigation of Hurdle Rates in the Real Estate Investment Process

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This report focuses on the question of how real estate investors make investment decisions. In particular, the research examines the extent to which hurdle rates are used and the key drivers of those hurdle rates.

Corporate finance theory comes up with a clear preferred approach for a company's 'standard' or typical projects – discounted cash flow (DCF) analysis and the use of Net Present Value (NPV) to determine the financial benefits of projects.

In that usage, the hurdle rate should reflect an organisation's weighted average cost of capital (WACC). The cost of capital reflects the cost of debt and the required return for equity holders which, in turn, reflects the risks of the activities of the firm and the firm's capital structure, and the mix of debt and equity used by the firm.

This approach is seen as being most suitable for a firm with a dispersed equity holding (for example, a listed property company), with many standard projects where the cashflows are largely determined outside the firm. Where the cashflow of a project can be altered more directly by the actions of the manager (and the timings of the actions) or where the returns generated are dependent on the outcomes of adjacent projects outside the control of the firm (that is, requiring competition or cooperation) then more complex models are called for including real options or game theoretic approaches.

While the theoretical literature is consistent in its advice, surveys reviewing what happens in practice in other industries suggests a more widespread use of other approaches and a focus on simple metrics, e.g. payback or profit on cost. In addition, where DCF is used the decision criteria are based around the internal rate of return (IRR) of the project rather than the NPV. There is limited evidence on what happens in real estate – a gap which this study addresses.

The research found that hurdle rates are widely used in investment decision-making. However, market practice varied widely on how hurdle rates were determined. Key differences were driven by the type of organisation, size of organisation, type or style of investment.

The first distinction was by type of organisation. For organisations looking to attract capital from clients for specific investment strategies, the target rates of return and performance targets of those funds determined the hurdle rates used within the funds and were, in turn, 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. Thus, hurdle rates are, to an extent, being determined outside the firm.

Those hurdle rates that were not determined by clients did not appear to conform to a weighted average cost of capital approach, but rather seemed linked to a valuation tradition with 'risk free rate plus risk premium' as the common basis for construction.

It was standard to adjust hurdle rates at project level, with market, sector and cycle adjustments augmented by property-specific premia representing, for example, covenant, lease structure, building quality and micro-location. The impact on market risk at the portfolio level rarely appeared to be embedded in the deal decision. Other findings from the interviews suggest that, while DCF was in frequent use, IRR dominated NPV as a decision tool; that non-cashflow metrics (particularly multiple and profit on cost) were in frequent use; that few organisations employed technically complex quantitative models in the investment decision process; and that there was little apparent back-testing of decision rules.

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It was also noted that in the decision-making process it was common for an investment or fund manager presenting the deal to an investment committee to have substantial 'ownership' including the power to amend and adjust model inputs such as fine-tuning of hurdle rates or required yields at asset level.

These findings indicate that real estate has not incorporated the insights from the literature into standard practice. Whilst this has been the case in other industries, there has been a trend in these industries towards criteria that are justifiable by financial theory. It might be that the real estate industry is lagging behind this trend or that core investments (for which these criteria are appropriate) are less important or prevalent than is thought, given the structure and characteristics of the commercial real estate market. For example, with shortening lease lengths, there are relatively few investments where cashflows can be considered exogenous (that is, not influenced by the action of management). However, where managers do have the ability to influence cashflows, there seemed a reluctance to use more complex methods or to systematically test assumptions and sensitivities.

Individual investment decisions seemed to take limited account of the wider portfolio context. The researchers were presented with few examples where the final investment decision was explicitly based on the risk-return impact on the portfolio as opposed to the risk-return and downside risk scenarios as they applied to the individual deal or asset. This was somewhat surprising given the requirement to manage fund risk (e.g. under the Alternative Investment Fund Manager Directive) but some argued that the pre-filtering before deals were progressed, reflected this portfolio risk dimension or prior portfolio structure decisions.

Skills issues were highlighted as a limiting factor on the use of more sophisticated techniques or more systematic approaches to testing assumptions and sensitivities. Further constraints to more rigorous quantitative approaches included data inadequacies and resistance from more traditionally-minded senior management.

1. INTRODUCTION

This report focuses on the question of how real estate investors make investment decisions. In particular, the researchers examine the extent to which hurdle rates are used and the key drivers of those hurdle rates.

The research included:

- A review of the literature on investment decision-making – both what firms should do, according to theory, and the literature that explores what firms actually do;
- Semi-structured interviews conducted with 32 individuals over the summer and autumn of 2016;
- A survey in the autumn of 2016 (with 56 responses); and
- Discussions of the findings in focus groups comprising senior professionals.

In finance theory, a firm making a capital budgeting decision – in real estate markets, the decision to buy or sell a building, to acquire land to develop, to undertake a major refurbishment – will assess the profitability of the project by discounting forecast cashflows using a discount rate which represents the required return or target rate of return for that type of project. Equivalently, the return generated by the project is compared to the required return which becomes a hurdle rate. Hurdle rates are linked to yields or capitalisation rates, since the yield can be represented as the required return less the anticipated long term growth in income (plus an allowance for depreciation).

In turn, the target rate should reflect the required return on the sources of capital funding the project: the return demanded by equity holders and the cost of debt. The return demanded should reflect overall interest rates in the economy, the anticipated return on government bonds and the risks incurred by investing in that type of asset. In the aftermath of the global financial crisis, interest rates and government bond yields fell sharply, in part due to the actions of central banks. However, as Figure 1.1 makes clear, there has been a systematic fall in UK nominal interest rates and yields from the late 1980s, partially, but not fully explained, by declining inflation expectations. This should have an impact on the required return for commercial real estate.

Figure 1.1: Reduction in Interest Rates and Yields (1986–2015)

Source: Bank of England (November 2016)

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1. INTRODUCTION

A further factor influencing yields and returns has been the growing internationalisation of major real estate markets (a trend that was not checked by the financial crisis, at least in core markets) and the arrival of new players and vehicles in real estate markets, including the growth of sizeable real estate portfolios in sovereign wealth funds and the establishment of large private global real estate funds and fund management platforms. This, allied to high levels of global capital seeking investment opportunities, has led to downward yield pressure, particularly in larger, more transparent and liquid markets, with implications for future returns in this market.

In this context, how do professional investors make decisions to ensure that the assets they acquire deliver the returns required by their stakeholders and that those returns appropriately compensate stakeholders for the risks taken? How are yields and required returns adjusted in a changing market? What techniques and models do real estate investors use and are these models sensitive to changing market environment and consistent with formal financial theory models and the approaches adopted in other markets? If they are not consistent, why is this? Does the commercial real estate market have characteristics that prevent the adoption of formal quantitative models and that require different, tailored approaches? It is these issues that are addressed in this report.

The Investment Property Forum (IPF) commissioned the Universities of Aberdeen and Cambridge to undertake research to determine whether investors use hurdle rates when making investment decisions and, if so, how they determine these when selecting and/or retaining real estate investments. Current practises and commonality of approaches among different types of investor were to be investigated. The IPF's brief asked that the research should address (the majority of) the following aspects:

- The extent to which formal hurdle rates are used in investment decision-making across a range of investor types (both domestic and overseas);
- The methodologies used for establishing hurdle rates;
- The biggest elements of risk that drive variations in hurdle rates;
- Whether different rates apply to different assets, defined by geography or other characteristics, such as income profile, leverage, etc.;
- Whether there is a pattern to the approach adopted by different types of investor (with differing mandates);
- What other investment parameters (e.g. a minimum absolute return or yield requirement) do investors look at as part of the investment decision process?

The research design sought to address those aspects by seeking to establish market practice regarding the use of hurdle rates, analysing any divergence from theoretical 'best practice' across investor types and markets. In particular, the research would focus on how firms and funds establish hurdle rates and how they use them. The research aimed to examine the extent to which rates were adjusted for specific projects and investment opportunities.

1. INTRODUCTION

The research design consisted of four main elements:

(a) A conceptual and contextual analysis of hurdle rates as they are presented in the corporate and real estate finance literature, the review covering both theoretical recommendations and what is known about the actual use of hurdle rates in investment practice from survey-based research;

(b) An explorative analysis using semi-structured interviews to gain an understanding of the role of hurdle rates in the practice of real estate investment decision making. Interviews explored the impact of vehicle structure, capital structure and market environment and were transcribed and analysed using formal methods. Interview participants included key market players across a range of fund types, sizes, and domiciles;

(c) An extensive analysis of market practice using a structured survey of a wide range of investor types, including real estate investment trusts (REITs) and listed property companies, institutional investors, private equity investors, sovereign wealth funds and others. Primarily focused on UK-based investors, the survey also included international investors domiciled or head-quartered outside the UK;

(d) A critical appraisal of the interview and survey findings through focus groups with key market players and extensive discussion with the project steering group. The focus groups were run and analysed using standard protocols and subject to Chatham House rules. This leads to the final conclusions examining the use of hurdle rates in the industry, what drives change in rates, and how practice compares with theoretical precepts.

This report sets out the findings from the research. First, the researchers present a summary of the review of the literature on investment decision-making (what should firms do when taking capital budgeting decisions?) and the literature that explores what firms actually do.

Evidence from interviews and the survey is then presented. Semi-structured interviews were conducted over the summer and autumn of 2016 and the survey was conducted in the autumn of 2016. The respondents were from firms active in the commercial real estate market across a broad range of scale, types and activities ranging from large sovereign wealth funds and global fund managers to niche private equity investors and private offices. Most were UK-domiciled, but some were non-UK investors yet active in the UK market.

The findings from the interview and survey phases were presented to two focus groups (both held in London) and were discussed with the IPF's research project steering group to gauge reaction, to explore more deeply key findings from the research and to ensure market relevance. These discussions are brought together with the research team's thoughts on the conclusions and implications from the study in the final section of this report. Fuller discussions of elements of the research are included in a series of appendices.

2. LITERATURE REVIEW

A substantial body of literature exists that examines investment decision-making processes and explores how these relate to theory. This section summarises the literature with a more detailed review and references contained in appendix three to this report.

The literature highlights the difference between three types of investment where the cashflows:

- are embedded in the investment today (the manager cannot affect them significantly and they will be largely driven by the market). A 'core' investment, e.g. a property let on a relatively long lease would fall into this type;
- will be affected substantially by the actions of the manager. A 'valued-added' or 'opportunistic' investment would fall into this type, e.g. a property with substantial vacancies or short-term leases or a refurbishment or a development project;
- will be heavily influenced by the interactions with and actions of other market participants, e.g. two potential competing shopping centre developments where, if one is developed, the profitability of the other is substantially affected.

'Core' Investments

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) 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". Instead of using the hurdle rate directly for the NPV, it is also possible, in principle, to first find the discount rate that leads to an NPV of zero and to then compare this internal rate of return (IRR) with the hurdle rate. If the IRR is at least as large as the hurdle rate, then the project should be implemented. While the NPV and the IRR criteria will normally lead to identical decisions, the use of the IRR is often discouraged in the literature because, from a formal finance perspective, IRR is never a better investment criterion than the NPV, and at times a worse one. Payback methods are also discouraged in the literature, but it is recognised that where there is capital rationing or a defined life as in a closed-ended (fixed life) fund that this criterion makes sense – alongside the NPV rule.

The hurdle rate "is the minimum expected rate of return an investment must offer to be attractive" (Ross et al., 2006) and is also called the required return rate or the cost of capital. It is based on the idea that the investment manager acts on behalf of owners and should go ahead with a project only if it delivers at least the return on assets that have the same risk and are already traded in the market.

It will depend on the type of organisation if the cost of capital is easy to establish or not. For a listed REIT focused on a particular property type and location, e.g. London retail, the required return for an additional property of the same type should be very similar to that for the existing portfolio reflected in the cost of capital for the REIT. The Weighted Average Cost of Capital (WACC) is the capital structure weighted average of the required return rates that common and preferred shareholders demand and the marginal costs of debt, which are the interest rates demanded by bond holders and banks. While the marginal cost of borrowing is often observable, the required return on equity has to be estimated. The capital asset pricing model, CAPM, is the usual recommendation although it is subject to criticism as an over-simplification of the risks of assets. It has

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the benefit of focusing on systematic (market) risk. The literature warns about adding 'fudge factors' to hurdle rates, often done "because managers fail to give bad outcomes their due weight in cash-flow forecasts".

For projects that differ from a company's existing business, the literature suggests using firms focused on that type of project as a guide to the cost of capital. If this is not possible or impractical then the literature recommends a subjective approach to incorporate differences in exposure to (systematic) risk where the project differs from a firm's existing assets. For private investment vehicles, the literature notes that there may be explicit return hurdles but again, the emphasis when assessing new projects needs to be on the extent of market risk in the project.

Value-Add/Opportunistic Investments

Projects of this type have cashflows that can be altered by the investment manager in the future and are common in real estate, e.g. before a lease is signed there is a right but no obligation to lease it to a particular tenant. This optionality is the focus of the real options approach. A landlord will not necessarily rent to the first tenant appearing – even if this has a strictly positive NPV – and will wait and consider other potential tenants while being conscious of the costs of waiting. The complexities in the application of real options approaches are recognised in the literature, although there are examples of extensive usage in other industrial sectors.

Firm Interactions and Competition

Projects of this type have cashflows that can be influenced by the manager, but can also be affected by the actions of competitors. An example could be two developers who could go ahead with projects in the same area. If the completed projects are substitutes for each other, such as two similar office buildings, then the first mover will have an advantage. But if there is demand uncertainty, then waiting can also be worthwhile. Both projects therefore come with real options, but in a situation of strategic interaction between the firms and projects. Game theory is discussed in the context of strategic investment under uncertainty as it is not possible to simply probability-weight potential outcomes to make appropriate decisions.

Actual Investment Decision Behaviour – Evidence from Empirical Studies

Studies of actual investment decision processes have found that hurdle rates are widely used. Large and listed corporations are more likely to use the NPV or IRR criteria than small and private companies, with the latter more often relying on subjective criteria and 'gut feel'. There is some indication that investors using hurdle rates based on WACC and/or the CAPM are more likely to also use the IRR and capitalisation with multipliers. Investors who use subjectively-adjusted discount rates are prone to use other subjective criteria as well.

A company's WACC is widely used as the hurdle rate. Large companies are more likely to use the CAPM than small ones, public companies more so than private ones. Smaller companies often use target rates provided by their investors. There is evidence that managers often use hurdle rates that are substantially higher than the company's cost of capital "to correct for overly-optimistic cashflow projections in the projects they are asked to consider". This discrepancy can also be seen as reflecting capital and operational constraints and the reduction in option value from making a particular decision. Career concerns of managers also appear to play a part in both the use of higher hurdle rates and the use of other criteria, e.g. a manager wants projects which signal success quickly. There is also some evidence that hurdle rates for strategically important projects are deliberately lowered. Payback criterion is very popular amongst investment managers (particularly in smaller firms) and previous studies suggest that lack of sophistication is a driving factor behind the popularity of the payback criterion.

3. INVESTMENT DECISIONS AND HURDLE RATES: INTERVIEWS, SURVEY AND FOCUS GROUPS

3.1 Introduction

In this phase of the research project, the researchers conducted face-to-face interviews with 32 individuals from 27 firms and organisations active in the commercial real estate market along with an electronic survey with 56 survey responses. The organisations that took part were predominantly UK-based but included the UK/European head office of international firms. The researchers also spoke to non-domestic firms and funds investing in the British market and included European firms investing in other European markets in the survey. They covered a broad spectrum from large to small and from organisations focused on 'core' investments through to those focused on developments and more opportunistic investment. A more detailed explanation of the results is contained in Appendices Four and Five.

3.2 Processes and Responsibility

Most large and medium-sized organisations interviewed use a regular investment committee, or similar decision-making body, with papers prepared and presented to the committee. Smaller organisations sometimes have the same structure but others have more informal procedures with individuals having delegated powers to accept deals. The predominance of investment committee was also noted in the survey (57%). It seems that many investment committees have substantial power to ignore or override any formal decision rules: a typical example was "a deal which does not necessarily meet the performance criteria may be selected for other reasons". Equally, it is evident that often a substantial sorting and filtering process takes place before the investment committee meets or sees the decision memorandum: "the investment committee rarely declines proposals", "deals are rarely refused".

The researchers detected some discomfort with strongly formalised decision processes and points of friction between investment and fund managers seeking discretionary powers and control and research, analysis and risk teams seeking to ensure a consistency of approach and validate inputs. Another tension noted was where more complex, formal decision models clashed with the need for speed to complete a particular deal. It would be interesting to explore whether organisations conducted back-testing to see whether the outcomes of fast-tracked decisions were comparable to those going through more formal processes, although the evidence from interviews, surveys and the focus groups suggested that few organisations had any systematic back-testing procedures.

From both the survey and the interviews, it appeared that decision-making in investment committees is very much focused on the individual deal and its risk-return characteristics. Some respondents made explicit comment that the impact on the overall portfolio was considered as part of decision-making. However, in only a handful of cases was the portfolio impact central to the decision. Where the researchers were able to examine models in more depth, again these were largely focused on evaluation of project or building cashflows. Given that the focus of the research project was on target rates of return and hurdle rates in decision-making, this may be a reporting bias, but further research could usefully explore this in more depth.

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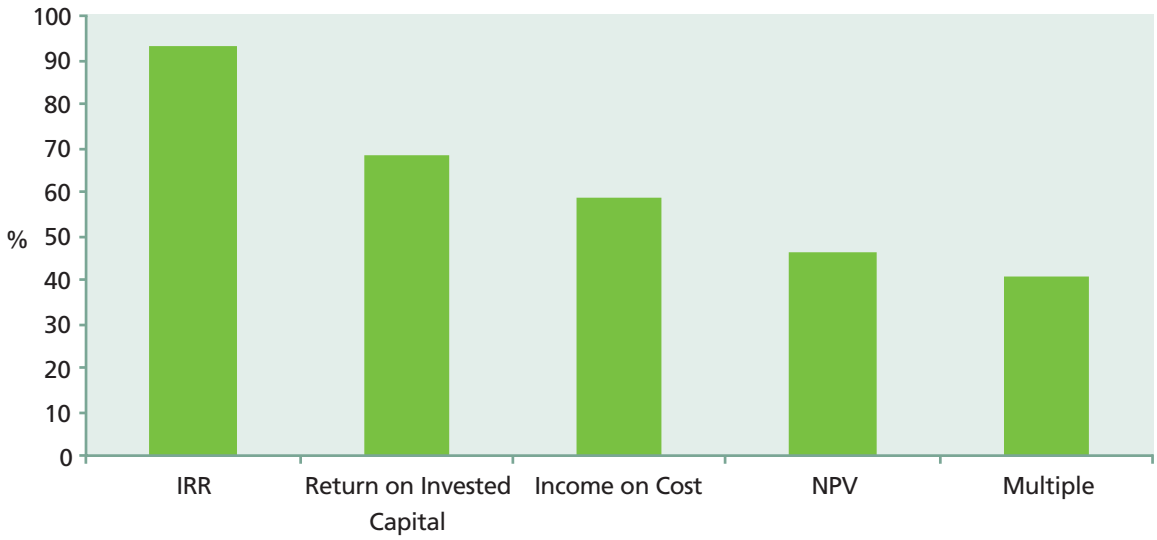
3.3 Decision Methods and Sensitivity Analysis

Consistent with prior research, both the interviews and the survey highlighted that the internal rate of return is the dominant approach for making decisions. The most frequently used decision tools are illustrated in Figure 3.1.

Figure 3.1: Most Frequently Used Decision Tools (% Response)



Source: Survey responses[1]

For some 70% of those interviewed, IRR was the primary decision metric. In the survey, 93% of participants ranked IRR as one of the top three tools used and 66% ranked it as first. This implies all these organisations should be employing a target rate of return approach (since, formally, the buy signal is when the IRR is higher than the target rate). Return on invested capital and income on cost were measures more frequently cited than NPV.

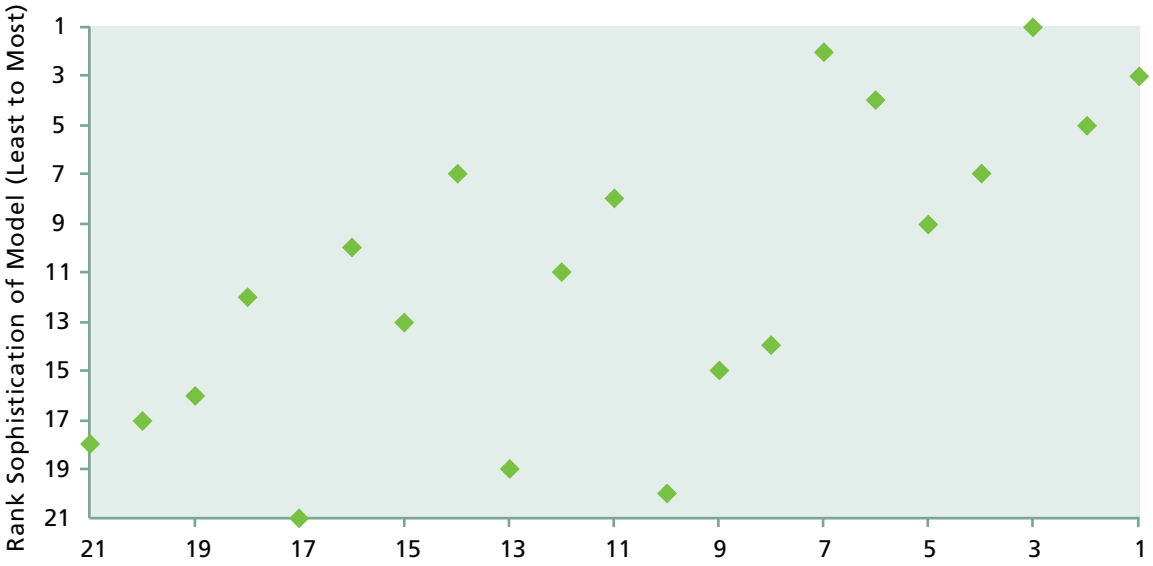
Where the IRR was not the primary decision, generally some form of metric approach was employed – equity multiple being the most common in the interviews followed by profit on cost or equivalent. NPV ranked only fourth. From both the interviews and the survey, metrics were most likely to drive decisions for smaller organisations (they were the primary decision tool for <£500m managers) and for private equity funds and developers, where avoiding loss of clients' capital appeared to be the major driver. A small number of larger firms with more sophisticated modelling techniques also focused on downside risk and loss avoidance – particularly where capital preservation was a key driver.

[1] IRR = Internal Rate of Return; ROIC = Return on Invested Capital; IOC = Income on Cost; NPV = Net Present Value; Multiple is any form of heuristic multiple, e.g. capital returned to capital invested.

3. INVESTMENT DECISIONS AND HURDLE RATES: INTERVIEWS, SURVEY AND FOCUS GROUPS

The level of technical sophistication of modelling approaches used varied considerably across organisations. The researchers define sophistication as use of formal, theory-led, quantitative models, use of structured scenario or sensitivity analysis, strong research or risk department involvement in model inputs and, generally, more complex processes. Possible explanations for the low adoption of structured analytic models include (perceived) difficulty of applying formal financial models to complex, heterogeneous assets like real estate (allied to lack of robust data to run such models in thinly-traded private markets); senior management reluctance to accept such approaches (the researchers did find indications of resistance even where there were formal models and also cases where formal models had been abandoned in favour of more individualistic appraisals); and gaps in the human capital needed to apply such models. There was a clear division between larger and smaller organisations with respect to modelling 'sophistication', with larger organisations generally being more sophisticated (see Figure 3.2).

Figure 3.2: Modelling Sophistication and Size of Organisation



Source: interview transcripts, research team assessment.

Given the many other factors that influence investment performance it is perhaps not surprising that there is limited evidence from existing research that larger organisations with more sophisticated approaches are able to consistently deliver superior investment performance at a property portfolio or fund level. However, size does appear to help managers attract capital, as highlighted in Krautz and Fuerst (2015, p.147), which may reflect both the deeper networks of larger managers and investors' views of their networks. The analysis of the impact of investment process and decision-making tools on subsequent investment performance is an interesting area for future research[2].

[2] There is mixed evidence of the effect of size on performance of private real estate funds and analysis is made more complex by non-linear economies of scale linked to assets under management. Cremmers and Lizieri (2013) in a study of active portfolio management, report that the lowest quintile of UK diversified real estate funds generated significantly lower mean returns and risk-adjusted returns than larger funds 2002-2011, although the largest quintile had slightly lower mean returns (albeit with a lower standard deviation) than the fourth largest quintile.

3. INVESTMENT DECISIONS AND HURDLE RATES: INTERVIEWS, SURVEY AND FOCUS GROUPS

In many cases, a range of scenarios were considered and the expected return and target return or hurdle rate (whether explicit or implicit) were assessed in the context of these scenarios. However, there was generally a subjective or 'gut feel' approach taken to the probability of different outcomes rather than a clear framework for this analysis. The wider portfolio impact of transactions was considered in making decisions by some investors but this was normally a secondary consideration. Where portfolio fit was raised, this was often i n the context of being broadly in line with strategy or some potential optionality benefit. Specific analysis of the contribution of an asset to helping to achieve objectives at a portfolio level, in terms of risk and return, was rare.

3.4 Hurdle Rates

Although a number of those interviewed and surveyed suggested that they did not use a hurdle rate or target rate of return in making capital budgeting decisions, the vast majority of respondents did, whether explicitly (85% in the survey) or implicitly (10% in the survey).

One important distinction that emerged at an early stage of the research was between organisations investing as 'principals', e.g. listed companies, endowments, major pension funds, and those who were managing funds for client investors. In the latter case, where there was an absolute return target, this became the de facto hurdle rate. For funds with a relative return target , then the target rate of return depended on expected or forecast rates of return (with a broad spectrum of approaches from formal forecasts at sector level to use of long-run averages or rules of thumb).

A standard answer from those with external capital sources was that the hurdle rate was based on "the requirements of clients". This raises the questions of how the client investors form those requirements, how they move in response to changing market environments and do client expectations (and absolute return levels) shift appropriately with 'rational' expected market returns to capital, both debt and equity? If the returns offered for core, value-added or opportunity funds remain relatively stable while bond yields, anticipated inflation and growth expectations fall, then this might be a signal of inertia, of stickiness in investor expectations with implications for fund manager behaviour.

For those organisations forming their own internal target rates of return, textbook models based on costs of debt and equity were conspicuous by their absence. While some hurdle rates were based on average or typical returns in a market (with differing levels of granularity and differences between those forecasting and those using historic averages, split broadly between larger and smaller organisations), the dominant model was a 'risk-free rate plus risk premium' model. That simple formula of Rf + RP, however, disguises a wide range of approaches, from simple rules of thumb to complex, layered models and pro-forma approaches.

The risk free rate was usually based on government bond yields but there was significant variation in which bonds were used for example in the approach to the duration used, whether a spot yield or some moving average or 'normalised' rates were used, and whether there were any adjustments to reflect quantitative easing, etc. Real bond yields were less commonly used with the vast majority using nominal yields. This raises questions about the consistency of the treatment of inflation when historic yields, growth rates and average returns are being utilised in models and investment appraisals.

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For those with international investment portfolios, there was a split between those using risk free rates from their domestic market (or benchmark currency for organisations offering, for example Euro-denominated funds but based in the UK) and those using local, target market, bond yields to proxy for sovereign risk and other systematic risk factors. Applied correctly, the two approaches should give comparable results. There was some evidence, though, of double counting of some risk premia and some signs of uncertainty as to whether real estate or national factors were driving the risk.

How those organisations using a risk free rate plus risk premia approach to the hurdle rate arrived at their risk premia varied greatly, from application of a single, property-wide risk premium to complex, layered approaches with multiple components. Where figures were quoted, the core real estate risk premium ranged from 2.25% to 3.5%, that number seemingly coming from analysis of historic returns, from survey analysis, or from an 'in-house view'.

One major source of difference lay in the treatment of individual asset risk. Some organisations made no adjustments at property level at all (having perhaps accounted for sector and market differences). For most organisations individual characteristics featured highly in the construction of the risk premium: building quality and characteristics, micro-location, leasing and covenant factors were common features along with sector level adjustments. In the survey, 80% of respondents applied a hurdle which was specific to individual projects or investments. In some instances, there was a formal process or scoring system for such adjustments; more normally this was a more subjective adjustment, made through group discussion.

The literature emphasises that application of a uniform WACC as a discount rate would be wrong for a firm with projects that had quite widely differing risk profiles. Equally, however, in a large firm, individual, idiosyncratic risk should be diversified away so the focus should be on systematic exposure to risk, not specific risk. This may be one way that real estate differs from the generic firm of corporate finance texts: smaller funds will have relatively few projects and hence will need to take more explicit account of specific risk. That said, in both the interviews and the survey, it was clear that some of the very largest investors still made detailed property level adjustments. It was also noted that hurdle rates would be increased for new sectors (48%) and in some cases for short-term investments (29%).

A number of organisations used some form of average real estate return as a hurdle rate, either as the primary decision threshold or as a check where there was a client-driven or internal absolute return target. These varied substantially in granularity, from single rates for the whole asset class (usually for core, unleveraged property) to detailed market-sector numbers. Where market returns formed the basis, they were typically based on historic averages although some funds used specific forecasts (this was most likely to be the case for funds with relative return targets such as beating MSCI-IPD by some margin). There was little discussion of the choice of time-period for historic averages and no discussion at all about adjustment for inflation expectations. In retrospect, the research should have probed more on this issue but the finding is consistent with the near universal use of nominal rather than real inputs in decision models.

For many organisations, development projects were treated differently, typically with a single higher, required return threshold. This seemed to be fixed across markets and time periods: "development projects are expected to deliver returns of 15%". Some funds (typically smaller ones) seemed to be including a 'profit' component in cashflows alongside a raised target rate, which would appear to be double counting risk.

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3.5 Impact of the EU referendum

In the survey, the researchers asked how the vote to leave the EU had affected hurdle rates. 68% of respondents recorded that their hurdle rate was unchanged, whilst 14% reported that they had increased hurdle rates. 4% responded that the hurdle rate had decreased, arguing that, for relative return clients, given that vote for Brexit had reduced market return expectations, so, by implication, the required return had fallen. Those arguing it had increased, highlighted the additional uncertainty and risk (whether about the economy, property growth or liquidity).

3.6 Feedback from Focus Groups

To gain further insights on these findings and to discuss how the structure and characteristics of the commercial real estate market affect the decision-making processes and models employed in investment deals, the researchers held three focus group discussions: one after the initial review of the literature and two further focus groups in London in November, to discuss the findings from the interviews and the survey and to provide an industry perspective on those results.

These groups confirmed a number of findings from the research, e.g. the standard corporate finance model of a firm basing its target rate of return on its own cost of capital did not fit well with the architecture of the commercial real estate investment industry, other than in the sense that the required (post-leverage) return for a fund is shaped by the returns demanded by the suppliers of equity capital. These groups provided an opportunity to discuss further how objectives are set, inertia in target rates and the potential implications in terms of additional risks and effort (complexity) needed to still meet targets. The focus groups highlighted the pre-filtering of transactions prior to investment committees and top-down elements of strategy. The focus on individual assets was defended on the basis that it was deal specifics that led to losses. The concerns regarding more quantitative methods were discussed with a wariness of these techniques in general, concerns over availability of data and concerns over skills and education. The focus groups also confirmed the interview finding that there was limited back-testing of results, and expressed some concern over this, acknowledging that, while difficult, back-testing would be good management practice.

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Hurdle rates are widely (almost always) used but with different approaches to formulation and adjustment. There are also substantial differences in how hurdle rates are applied in the decision-making process across organisations, and in the sophistication of investment decision-making processes.

IRRs are the dominant decision metric for all types of investment. The lack of use of NPV is not in itself a cause of concern (despite its superiority) but may reflect a lack of sophistication in the industry – which in turn is mirrored in the approach to modelling of more complex investments.

Larger organisations, with more resources, undertake more sophisticated analysis, challenge "gut feel" and consider other dimensions of risk. However, even in the largest organisations, there seemed limited use of advanced quantitative techniques and substantial reliance on subjective/judgemental adjustment and on market experience and expertise. In some instances, there was evidence of a retreat away from formal quantitative approaches back to a more intuitive, subjective approach, Hence, whilst hurdle rates are widely used, it is common for investment managers to override formal analysis and to alter model assumptions.

There are a broad range of methodologies used to establish hurdle rates. These reflect the diversity of investor type, asset and market focus, investment horizon and objectives. A major difference was between 'firm-type' organisations, where the target is internal and 'fund management-type' organisations where targets may be fund specific and are formed in relation to the expectations of client investors and rival offers of competitors. For 'firm-type' organisations, whilst some used a formal weighted average cost of capital approach this was not the norm, with core hurdle rates normally reflecting a risk free rate plus risk premium approach or being based on historic or forecast returns, perhaps deriving from more traditional property valuation approaches. Given the range of approaches, it was not surprising that there was neither a single nor a common element of risk driving the hurdle rate nor consensus on elements of risk that are the biggest contributors.

Where a risk free rate and risk premium approach were used, there were a range of government bond rates referenced (spot vs forward, nominal vs real). International investments were sometimes assessed by converting returns into domestic currency and using a domestic hurdle rate or by looking at the foreign returns against a specific hurdle rate for that market (and that project). Some approaches seemed inconsistent in the way that 'country level' systematic risk and inflation expectations were handled (appearing in the risk free rate, in the risk premium and in cashflows, without clear specification or separation or explicit consideration of interactions).

As noted in the literature review, projects where the manager has power to alter cashflows (that is, deals that might be characterised as value-add or opportunistic) may not fit with standard asset pricing, cost of capital approaches but it was here that adjustments based on market judgement were most prevalent. As before, larger organisations (particularly those operating across asset classes) were more likely to employ formal models and templates to determine a baseline target rate of return, yield or risk premium. Approaches based on real options (or informed by real options thinking) were conspicuous by their absence. This was justified in terms of the unique characteristics of real estate as an asset, but there are many examples of equally heterogeneous assets where such approaches are adopted.

Hurdle rates are typically adjusted for each and every project – although a small number of organisations do take an overall hurdle rate approach for all investments. At the project level, these adjustments reflect individual property characteristics (building quality, micro-location, tenant covenant, lease length, etc.). This confirms a tendency in current practice to focus on individual project risk rather than the impact on portfolio

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risk. It appears that the wider portfolio context for individual investment decisions is not well-integrated into formal investment processes. In part, this reflects the lumpiness of investment and the difficulty of diversifying a privately-held real estate portfolio, but this applies largely to smaller funds and organisations. The focus on idiosyncratic risk seems deeply embedded in the industry and justified by the negative consequences of individual project failures (with these not seen as being offset by diversification effects elsewhere in the portfolio).

Most of those interviewed used sensitivity and scenario analysis, but this was rarely formalised (for example through assignment of probabilities to scenarios or through the use of simulation techniques). The emphasis was on downside risk – what might go wrong? This is also consistent with a view that, with larger individual deals representing a significant share of overall portfolio exposure, specific risk is important – that a deal that fails badly can have a very significant impact on overall performance of a firm or fund. While this is more likely to hold for smaller and more concentrated funds, it seemed to be a general view and one that also justified the granular approach to determining risk premia. Since weights and probabilities are rarely attached to the scenarios, determining the significance of downside risks becomes a judgement call.

It was also apparent than many investment managers add a premium over any objectives/derived hurdle rate from cost of capital. This may reflect a desire to deliver performance in excess of that required by the equity providers and/or providing a buffer to deal with capital or resource constraints. Conventional finance models assume that resources can be found to manage any and all NPV-positive projects, but this is unrealistic where there are budget constraints and where very specific management skills are required. Hurdle rates above WACC filter out marginally profitable projects, reducing the resourcing pressures.

Some hurdle rates are stickier than others – those seen as exogenous (driven by what clients want) can be slow to change to new market realities. This can lead to pressures to increase risk in order to achieve returns ('style drift'). This was a recurrent theme of interviews and focus groups.

The approach to development appraisals appears to differ from standing investments; often an absolute hurdle or profit margin approach is applied that appears uncorrelated to the return environment or hurdle rates on standing investments. Traditional development appraisal models with in-built 'developer's profit' elements and common discounting of debt and project cashflows (that is, with debt costs included in pro-forma cashflow models) remained commonplace.

In terms of differences across investor type and types of transaction the following were noted:

- Larger investors tend to do more sensitivity analysis and to use more sophisticated methods, particularly if part of a multi-asset portfolio or organisation;
- More opportunistic funds focus on absolute return targets and less on out-performing the market/expected returns;
- IRR and hurdle rate comparison is standard but there is more focus on equity multiples in more opportunistic funds;
- For developments, profit on cost is widely used as a metric;
- For many investors, income on cost is part of decision-making process;
- For some client groups, income is the key consideration in investment decisions;
- The time available to underwrite a transaction influences the hurdle rate[3].

[3] That is, if a deal must be closed quickly, then required return increases: this would be consistent with increasing the risk premium to reflect a lower level of due diligence.

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There does not appear to be a well-developed culture of learning and analysis. There is limited evidence that judgement, assumptions and models are reassessed and back-tested. The focus groups identified resource and skill constraints as playing a role in this. Nonetheless, given the claimed importance of individual deals on achieved performance, it seems surprising that the elements of investment decisions are not subject to careful analysis and scrutiny. Clearly it would only be possible to analyse deals that were 'accepted', adding a complication to such formal back-testing processes.

The peculiarities of real estate appear to be used as justification for gut feel and judgement, rather than alongside detailed and rigorous analysis. There was some concern expressed by industry participants that the industry lacks the skills to appreciate and incorporate more sophisticated analysis. If this is an educational deficiency, the industry could pressure universities to include such models (and use knowledge of advanced techniques as a selection criterion in graduate recruitment). To the extent that more advanced techniques are already taught to entry-level graduates, there remains an issue of the acceptability of such approaches to more senior practitioners, the creation of a context in which more advanced techniques could be encouraged and flourish – and the inevitable issue of the robustness and granularity of data to support their application.

To summarise the key points:

- Hurdle rates are widely used in real estate investment decision-making.
- IRR is the dominant decision-making metric. NPV is not widely used despite its superiority.
- While some larger organisations use more sophisticated methods, the application of sensitivity and scenario analysis is rarely formalised.
- 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.
- 'Firm-type' organisations have a more internal target – they tend to use a risk free rate plus risk premium approach to setting hurdle rates although weighted average cost of capital approaches are used.
- Hurdle rates that are used are typically project-specific, with the focus on project risk and impact of individual decisions on the wider portfolio is generally not well integrated into formal investment processes.
- The industry appears to have a tendency to set targets for out-performance above risk adjusted hurdle rates. The researchers' recommendation is that there should be more attention on more fairly reflecting the uncertainty of outcome in expected cashflows rather than making additional adjustments to hurdle rates.
- The research team's view is that hurdle rates should reflect the impact on portfolio risk and the cost of capital and that expected returns (cashflows) should be assessed in their overall portfolio context, not considered in isolation.
- 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.

APPENDIX A: LITERATURE REVIEW

Introduction

A substantial body of literature exists that examines if and how capital budgeting decision criteria are used in companies' investment processes. These studies are conducted predominantly by surveying and interviewing financial decision makers. The overall outcome of these studies is that formal capital budgeting criteria are used in practice, but that they are often supplemented by criteria that – according to investment theory – should only be applied with care or should not be applied at all. There are also types of projects for which theory provides investment criteria, but these are only rarely applied directly by practitioners. A body of literature exists that tries to make sense of these empirical findings.

The literature review starts with a characterisation of investment projects and discusses then for each type the criteria suggested by investment theory. This is followed by a discussion of the reviewed survey studies and their findings. The review closes with explanations for the divergence between investment theory and practice.

A.1 Types of Investment Project

Following Brennan and Trigeorgis (2000), there are effectively three types of investment projects. In the first, the investment manager is confronted with a project that has exogenous cashflows that cannot be altered by the manager in the future. In real estate, such a project would include some of what are called 'core' investments and would correspond to a fully rented building with long-term rental contracts. Corporate finance textbooks are very clear about the investment criteria that should be used for projects of this type. In the second type of investment project, future cashflows can be altered by the manager. In real estate, such types of project would include those that are called value-added or opportunistic, depending on the degree of flexibility that the project brings. A building with vacancies that can be filled or that has rental contracts that can be adjusted in the future would also be such a project. Another example would be a piece of land that the owner could develop in the future. The landowner knows today that she will wait for the best moment in the future and this makes the cashflows endogenous. Corporate finance theory prescribes that real option models provide the appropriate investment criteria in this situation. In the third type of project, strategic interactions between market participants play an important role. For instance, two developers might be interested in opening a new shopping centre, but only the first will be profitable. Another example would be an office development which needs a range of other amenities (cafes, restaurants, hotels, shops, etc.) nearby to be developed and where those are dependent on the office development. This is currently an active research area, but has not found its way into corporate finance textbooks.

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A.2 Investment Decision Criteria as Recommended in Finance Texts

Projects of the first type: core investments

For projects of this type that have cashflows that cannot be altered by the manager, investment theory prescribes that the net present value (NPV) should be used as the investment criterion. The NPV shows if a project adds value to a firm or not. The NPV is obtained in two steps. Firstly, the project's expected future net cashflows are discounted to the present date at a rate commensurate with project's risk. This discount or hurdle rate is often not directly observable. Textbooks describe how managers should estimate the hurdle rate for a project, which will be discussed below. Secondly, once a project's present value is computed, the project's initial investment costs are subtracted from it, leading to the NPV. Brealey et al. (2007, Table 7-3) 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 proper rule for choosing among mutually exclusive investments". Real estate investment text books follow this reasoning. Brown and Matysiak (2000, p.157) state that the 'only valid investment decision [criterion] is to use the net present value". Geltner et al. (2007) spend several chapters on the calculation of the present value.

Instead of using the hurdle rate directly for the NPV, it is also possible, in principle, to first find the discount rate that leads to an NPV of zero and to then compare this internal rate of return (IRR) with the hurdle rate. If the IRR is at least as large as the hurdle rate, then the project should be implemented. While the NPV and the IRR criteria can lead to identical decisions, the use of the IRR is often discouraged in textbooks. As Brealey et al. (2007, Table 7-3) point out, the "IRR cannot rank mutually exclusive projects – the project with higher IRR may have lower NPV." For instance, a parcel of land could be developed as a shopping centre or an office block with some shops, but not both. If one project has a higher NPV, but a lower IRR than the alternative project, then the IRR investment criterion would induce the wrong development decision (Geltner et al. 2007, p.219)[4]. Furthermore, the IRR for a project may not be unique. This can happen for projects that have periods of positive and negative expected cashflows as might be the case for a development project or a real estate deal that involved significant capital expenditure and repositioning after expiry of an existing lease (Berk and DeMarzo 2014, pp.210).

Because the IRR is never a better investment criterion than the NPV, and at times a worse one, corporate finance and real estate investment textbooks usually discourage its use. The same applies to the payback criterion, which assesses how long it takes until the project has covered its implementation cost. Textbooks discuss this method, because it is used in practice, but warn of its shortcomings. Berk and DeMarzo (2014, p.210) write: "The payback rule is not as reliable as the NPV rule because it (1) ignores the project's cost of capital [the hurdle rate][…], (2) ignores cash flows after the payback period, and (3) relies on an ad hoc decision criterion (what is the right number of years to require for the payback period?)". The discounted payback criterion is a modification that at least considers discounting, but is still vulnerable to (2) and (3). For Berk and DeMarzo (2014, pp.208), any investment criteria other than the NPV can lead 'to bad decisions that reduce wealth."

[4] This is obviously only relevant if the IRRs are always larger than the corresponding hurdle rates.

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This does not necessarily mean that these criteria should be ignored completely. First, as Ross et al. (2006, p.284) discuss, alternative criteria can be useful for "assessing whether or not the estimated NPV is reliable. For this reason, firms would typically use multiple criteria for evaluating a [project] proposal". But even here, the alternative criteria should only play a supporting role and should never overrule the NPV criterion. Second, it might be that investors face capital rationing, in which case the payback criterion can make sense. For example, Brown and Matysiak (2000, p.147) discuss the case of a liquidity constrained real estate developer, who might prefer projects that pay back quickly, even though alternative projects might have a higher NPV. This developer will then use the payback criterion to decide on projects. The payback criterion can also be relevant for private real estate funds organised as limited partnerships. Such funds have a fixed life and the general partner must ensure that the proceeds can be paid out at the end.

The textbook literature not only prescribes that the NPV should be used as investment criteria, but it is also specific about how the NPV criterion should be implemented. The implementation process starts with the estimation of project's cash flows distribution. The estimation can be facilitated by several different methods. This often depends on the data that is available. The implementation process continues with the estimation of the hurdle rate. This rate "is the minimum expected rate of return an investment must offer to be attractive" (Ross et al., 2006, p.420). The minimum rate is often also called the required return rate or the cost of capital. It is based on the idea that the investment manager acts on behalf of company's owners and should go ahead with a project only if it delivers at least the return of assets that have the same risk and are already traded in the market. It will depend on the type of company if the cost of capital is easy to establish or not.

If a listed company wants to decide on a new project that is similar to its existing projects, then the hurdle rate for the project will be equal to the cost of capital of the company. Take as an example a Real Estate Investment Trust (REIT) that holds only London retail property and wants to buy another retail building in the area. The building will be very similar to the ones already owned by the REIT. It follows that investors should require the same return rate for the new building investment as they do for an investment in the REIT. If the REIT were completely equity financed, then past rates of return could be used to estimate the cost of capital and thus the hurdle rate. However, once the REIT uses different sources of financing, the capital structure has to be considered to arrive at the hurdle rate. The Weighted Average Cost of Capital (WACC) is the textbook method to do this. The WACC is a capital structure weighted average of the required return rates that common and preferred shareholders demand[5] and the marginal costs of debt, which are the interest rates demanded by bond holders and banks, see Berk and DeMarzo (2014, Chapter 14.3). As interest payments might be tax deductible – not relevant for the REIT – borrowing cost have to be adjusted to consider these benefits, see Berk and DeMarzo (2014, Chapter 14.3).

[5] Variants of the discounted cashflow approach allow for estimation of cashflows after allowing for servicing of debt (and sometimes any tax effects): the cashflows reflect the 'flow of equity' of the project. Such an approach would discount the cashflows at the cost of equity not the WACC. Care needs to be taken given that debt service cashflows are likely to be less risky than those arising from the project itself.

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While the marginal cost of borrowing is often observable, the required return on equity has to be estimated. This should be done by assessing the return rate investors will require for investing in the residual cash flows after other financing components have been serviced. This could be based on past equity return rates, if those are observed, but will often require the use of an asset pricing model. The capital asset pricing model, CAPM, is the usual recommendation. The textbook literature is aware that the model is not perfect, but "the imperfections of the CAPM may not be critical in the context of capital budgeting and corporate finance, where errors in estimating project cash flows are likely to have a far greater impact than small discrepancies in the cost of capital" (Berk and DeMarzo 2014, p.423). Kaplan and Ruback (1995) provide evidence for this statement. They use the CAPM to estimate the hurdle rate and estimate firm values using it; the resulting values are fairly accurate compared with actual transaction prices. Some textbooks discuss other asset pricing models, such as fundamental factor models, that could be used for the estimation of the hurdle rate; see for instance Brealey et al. (2006, pp.197) and Berk and DeMarzo (2014, Chapter 13.7). In addition to allowing for the computation of the required return rates of components of the capital structure, the CAPM (or any other asset pricing model) also has an educational element, because it "gets managers to think about risk in the correct way" (Berk and DeMarzo 2014, p.423). In this context, 'thinking in the correct way' should be taken to mean that only systematic risk for that asset type should matter for the hurdle rate and that detailed adjustment of the discount rate to reflect the idiosyncratic features of an asset is inappropriate. Geltner et al. (2007, pp.569) emphasise that these insights from the CAPM apply naturally also to real investments. Correspondingly, textbooks warn about adding 'fudge factors' to hurdle rates, often done "because managers fail to give bad outcomes their due weight in cash-flow forecasts. […] If the cash-flow forecasts are prepared properly, the discount rate should reflect only the market [systematic] risk of the project" (Brealey et al. 2007, p.312).

The above discussion was based on two assumptions. First, that the project is similar to company's existing business and that the market information is easily available, because the company is listed. If the project under evaluation is different from company's usual business, company's WACC are likely to be an inappropriate choice (Ross et al., 2006, pp.485; Brealey et al. 2007, pp.310; Berk and DeMarzo 2014, p.419). If this is the case, Ross et al. (2006, pp.487) suggest the following two approaches to find a project-specific hurdle rate. The first is the pure play approach, where the hurdle rate is estimated using information from firms that are exposed to the same risk as the project. As a specialised project will be exposed only to a few risks, firms that specialise in these risks are preferred. For instance, if the risk underlying the project is the oil price, then price information of firms solely active (purely playing) in the oil sector should be used to estimate the required return rate on an oil investment. The pure play approach can only be used if suitable firms exist in the market and all the information necessary to compute the discount rate is observed.

The second approach is the subjective approach. Starting from a firm's WACC, the investment manager makes adjustments to this rate to incorporate exposure to (systematic) risk where the project differs from firm's existing assets. As Ross et al. (2006, pp.488) write, the subjective approach is often adopted by firms: "It would be better, in principle, to objectively determine the required return for each project separately. However, as a practical matter, it may not be possible to go much beyond subjective adjustments because either the necessary information is unavailable or else the cost and effort required are simply not worthwhile." Brealey et al. (2007, p.335) are positive about the subjective approach and write that the project-specific hurdle rate can be based on the company-wide WACC if adjusted properly to reflect project risks. If managers have a good feel for relative differences in riskiness between projects, then this might

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result in appropriate decisions at the firm level.this might work. For instance, a REIT could establish different risk classes for different building types and areas with corresponding hurdle rates and match each individual project with one of these classes. To derive the present value of the respective building, the expected cashflows are discounted with the hurdle rate of the respective risk class.

Neither of the approaches discussed so far to estimate the hurdle rate is entirely suitable for managers of private investment vehicles such as real estate funds[6]. First, investment shares in such funds are usually not actively traded and even if they are, trading prices will not be publicly observable. This implies that the pure play approach cannot be implemented. Second, managers usually run many funds and could learn in principle something about the risk preferences of different types of investors. However, given the heterogeneous nature of projects, such learnt required return rates have to be adjusted for differences in systematic risk between old and new projects. The alternative would be to estimate the required return rate for a new fund based on cashflow projections with CAPM. However, only large management companies will have the resources and sophistication to follow such an approach. This would be in line with the quote of Ross et al. (2006, pp.488) that it would be best "to objectively determine the required return for each project separately". While it seems that fund managers have less choice regarding the methods they can use to estimate hurdle rates, at times it might not be necessary to do this at all. This could happen if a fund's investors set the manager a target rate and this rate gives a good indication of what the market requires on average for typical real estate investments. The manager still had to adjust the required return rate for each project with the subjective approach to find those projects that generate extra value and those which do not. This task should be easier with knowledge of investors' target rate.

While the real estate literature has broadly followed the corporate finance literature since the 1980s in advocating discounted cashflow method and the NPV criterion, the link is at times obfuscated by the use of specific terms and notation. Brown and Matysiak (2000) give a careful account that shows that much of the real estate valuation literature is based effectively on the idea of discounted cashflows. For instance, the standard yield capitalisation model used in real estate appraisal – see Baum and Hartzell (2012, Chapter 7) – can be motivated with the Gordon growth model. This latter model is also known as dividend discount model in the corporate finance literature. It assumes that the expected cashflow grows with rate g and that the cashflow distribution's exposure to systematic risk remains unchanged over time. Investors will then require the same return rate r in all future periods. This required return rate is the sum of the risk-free rate, Rf (r_f) plus the risk premium, Rp (r_p). In a real estate context, the expected cashflow growth, g, is the difference between rental growth, g_r, and the depreciation rate, d. The present value in the current period is then simply:

Equation A.1

$$V_0 = \frac{CF_0}{r_f + r_p - g_r + d}$$

Cashflows are received in arrears and CF_0 is the cashflow at the end of the current period.

[6] Effectively, the same applies in varying degrees also to other investment vehicles and non-listed companies. All should use the WACC for their investment decisions, but the calculation of the hurdle rate become even more complicated given the additional information constraints they face.

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Reformulation gives:

Equation A2

$$\frac{CF_0}{V_0} = r_f + r_p - g_r + d$$

Under the assumption of this model, the initial yield of a building, which is the current cashflow divided by building's price, is thus an indication of the growth adjusted required return rate. If a sufficient set of such yields is observed, a valuer can use this evidence to derive an average yield as measure of the average or marginal investor's growth adjusted required return rate. This average yield can then be used to capitalise the cashflows of the project under valuation.

Average yields can also be used directly as a 'reservation yield' – effectively a hurdle rate – to inform buy and sell decisions. For instance, if building A can be purchased at price P_A with an initial yield higher than the reservation yield and building B can be sold at price P_B with an initial yield lower than the reservation yield, so that Equation A3 holds, then both deals have strictly positive net present values and should be implemented.

Equation A3

$$\frac{CF_A}{P_A} > \left(\frac{\overline{CF}_0}{P_0}\right) > \frac{CF_B}{P_B}$$

If the new projects differ in their exposure to systematic risk and growth expectations from the projects used to estimate the reservation yield, then further adjustments to this effective hurdle rate will be necessary. In the valuation practice, there is a tradition of very detailed micro-adjustments for building, lease and location characteristics. These adjustments often seem to relate to specific rather than systematic risk factors. There is also the further complication that the reservation yield might be of limited guidance if a particular manager using it has different characteristics from other managers active in the market, particularly where capital market imperfections are important. For example, differences in sensitivity to liquidity could make a sub-market or sector acceptable to one, but unacceptable to another manager.

Projects of the Second Type: Value-Add or Opportunistic Investments

Projects of this type have cashflows that can be altered by the investment manager in the future. Value-add and opportunistic projects that provide such flexibility are pervasive in real estate. Financial economics provides the so-called real options theory to derive how investors should act optimally in such an environment. Real option theory is based on the theory of financial options, but assumes a real asset as underlying. For example, the presence of a vacant unit in a shopping centre gives the landlord the right, but not the obligation, to lease it to a particular tenant. Signing the lease contract implies that the real option is exercised and to reverse this is costly. The astute landlord will therefore not necessarily rent to the first tenant appearing – even if this has a strictly positive NPV – but will wait and learn about possible tenants. Based on the landlord's beliefs about possible tenants and their willingness to pay, the landlord will not wait forever, because no rental income will be generated during this period.

Corporate finance textbooks usually cover real option theory at a basic level; see, for instance, Ross et

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al. (2006, Chapter 14.6) and Berk and DeMarzo (2014, Chapter 22). Copeland and Antikarov (2003) is a monograph targeted at practitioners. Real options also feature in real estate textbooks, see Brown and Matysiak (2000, Appendix 8G) and Geltner et al. (2007, Chapter 27). Real option models become complicated in realistic settings and discussion is beyond the scope of this report. As Berk and DeMarzo (2014, p.795) discuss, real option modelling requires extensive expertise and time. Modelling must be project specific and there are limited economies of scale[7]. Many companies that have real options to delay investments resort, therefore, to rule of thumb decision criteria. Berk and DeMarzo present two such criteria, see also McDonald (2000). The first criterion fixes a threshold for the profitability index (project NPV to initial investment cost[8]). The threshold is strictly larger than zero, which implies that projects that have a strictly positive NPV might not be implemented. Berk and DeMarzo (2014, p.795) explain: "It is often better to wait too long […] than to invest too soon". The second rule of thumb criterion raises the hurdle rate above the level it would take if the project could not be delayed. The problem with such rule of thumb criteria is that they are ad hoc. An exception is the case of interest uncertainty, where Berk (1999) has derived a simple approach to adjust the required return rate using the rate of callable annuities (or mortgages).

Projects of the Third Type: Firm Interactions and Competition

Projects of this type have cashflows that can be influenced by the manager, but can also be affected by the actions of competitors. An example could be two developers who could go ahead with projects in the same area. If the projects are substitutes, such as two office buildings, then the first mover will have an advantage. But if there is demand uncertainty, then waiting can also be worthwhile. Both projects therefore come with real options, but in a situation of strategic interaction. If the projects are complements, such as an office building and a business hotel, waiting for high cashflows and waiting for the actions of the other developer makes sense. In other instances, the action of a competitor can undermine the investor's decision: Helsley and Strange (2008) give the example of two developers competing to produce the highest skyscraper in a city: the winner gains from a premium related to status, the loser incurs excess costs and is not compensated by a maximum height bonus. Such models are not yet covered in corporate finance or real estate investment textbooks. Monographs on strategic investment under uncertainty are Chevalier-Roignat and Trigeorgis (2011) and Smit and Trigeorgis (2004). Typically, such analyses rely on game theory and are very difficult to implement practically.

A.3 Actual Investment Decision Behaviour – Evidence from Empirical Studies

Many academic papers have examined if, and how, investment decision makers follow the investment process prescribed by investment theory. The studies have targeted different company types and countries. For instance, Graham and Harvey (2001) and Poterba and Summers (1995) target large US corporations that are represented in the Fortune 500 or 1000 list, respectively. Manigart et al. (2000) and Dittmann et al. (2004) target venture capitalists in the US and Europe. Danielson and Scott (2006) target small firms and Harjoto and Paglia (2012) privately held firms.

[7] However, if the modelling is complex and resource intensive, this would suggest that such techniques may be more efficient for larger properties and transactions.

[8] Note that this is a DCF version of the more familiar 'profit on cost' metric.

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The papers use survey research methods, often a combination of focus groups in the initial stage, which are then used for questionnaire development, followed by a postal or internet based survey. Professional bodies often act as partners and approach their members to participate in the survey. This can be complemented by targeting of specific firm types. For instance, Graham and Harvey (2001) conducted their study in cooperation with the Financial Executive Institute (FEI). They approached members of the FEI who were Chief Financial Officers (CFOs) and they also approached CFOs of Fortune 500 companies that were not FEI members. It is a difficult matter to decide on a sampling population that is a fair representation of all relevant actors in the market. In addition, it is often challenging to obtain a sufficient number of responses. Given that CFOs' time is very valuable, this is understandable. Response rates – if reported – can be as small as 2 to 3% (Jacobs and Shidasani 2012; Jagannathan et al. 2016), but can also be as high as 58% (Manigart et al. 2000)[9].

It is agreed in the literature that questionnaires should avoid technical terms from finance theory, as this could steer respondents towards them (Jagannathan et al. 2016, p.3). Free format text boxes are also considered useful, as these allow respondents to provide individual answers (Arnold and Hatzopoulos 2000). Questionnaires contain usually 15-20 questions on the capital budgeting process and investment criteria. Questionnaires usually also inquire information about the company and the investment decision maker. This allows to relate the use of the different criteria to company characteristics.

In advance of reviewing the empirical results of the existing literature, two important points should be noted. Firstly, it is useful to distinguish between investment criteria based on discounted cashflows and those that are not. NPV, IRR and the profitability index – capitalisation with multipliers could also be considered here – are members of this first group. The NPV discounts expected cashflows with the hurdle rate and subtracts from this the initial project cost. If larger than zero, the project should be implemented. The profitability index gives exactly the same investment recommendation if the critical index level is set to zero. In most cases, the IRR criterion will lead also to the same investment decision if the hurdle rate is used as the threshold IRR. Capitalisation with a multiplier applies implicit discounting with a market hurdle rate. A second group contains subjective financial and non-financial criteria. For instance, the payback criterion is a subjective financial criterion, as are criteria based on accounting information, such as the accounting rate of return (ARR). Gut feeling is a non-financial subjective criterion. This useful grouping cannot be exploited fully in this review, however, as studies often do not report explicitly whether investment criteria are used together or not.

Secondly, the researchers note that there is always a risk that different people will understand the same terms differently. For instance, some investors will be used to the term discount rate, but not hurdle rate. Questionnaires should prevent such potential for misinterpretation. For example, Jagannathan et al. (2016, questionnaire question 5) use the sequence "hurdle rates/target rates/discount rates" to ensure exact interpretation. However, many of the studies reviewed do not mention if and how potential misinterpretation is prevented. The review will take the studies and their use of terms at face value, even though this could introduce misinterpretation to some degree[10].

Use of Hurdle Rates

For US companies, there is much evidence that hurdle rates are used frequently in the investment decision process. 91.2% of those responding to the survey of Poterba and Summers (1995, pp.44) state that they use

[9] Some studies, such as Jagannathan et al. (2016), match the survey responses with other information of the companies. Missing values in such archival data can reduce the final sample substantially.

[10] For instance, Graham and Harvey (2001) also use – in addition to NPV, IRR, and profitability index – the investment criterion 'hurdle rate'. The authors do not explain this. As used in this literature review, the hurdle rate is a benchmark and not an investment criteria as such.

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hurdle rates when assessing a project, 62% use nominal hurdle rates. 97% of the companies responding to the survey of Jagannathan et al. (2016, p.3) state that they use investment criteria based on discounted cashflows and thus criteria that require hurdle rates. Graham and Harvey (2001, Figure 2) provide similar evidence, which shows that 75.7% (74.9%) of managers use the IRR (NPV) always or almost always. Graham and Harvey (2001, p.200) also find that large and listed corporations are more likely to use the NPV or IRR criteria than small and private companies. Arnold and Hatzopoulos (2000, Table 3) obtain similar results for UK companies. Pike (1996, Table 3) finds for large UK companies that 88% used discounted cashflow methods in 1992, whereas only 58% did so in 1975. The IRR is the dominant criteria amongst discounted cashflow methods, used by 81% of companies used in 1992 (NPV 74%), up from 44% (NPV 32%) in 1975.

Danielson and Scott (2006) find further evidence that small US companies proceed differently from large companies when deciding on new projects. Small companies rely often on subjective criteria such as gut feeling, see also Harjoto and Paglia (2012). This corresponds to the results of Dittmann et al. (2004, Table 4 and p.610), who find that only 53% of their surveyed German venture capital funds use the present value, 23% use the IRR and 26% capitalise profits with a yield. Of those stating that they use present values, two-thirds apply 'subjective, ad hoc adjustments' to the discount rate. Experience and gut feeling are also a very prominent investment decision criterion. Dittmann et al. (2004, Table 6) also examine if the use of investment criteria is clustered. They find that investors using the present value with hurdle rates based on WACC and/or the CAPM are more likely to also use the IRR and capitalisation with multipliers; investor who use subjectively-adjusted discount rates are prone to use other subjective criteria as well.

Estimation of Hurdle Rates

There is some evidence about how companies actually arrive at their hurdle rates and how rates are adjusted – if at all – for individual projects. As large corporations engage often in separate business areas, they should have more than one hurdle rate. Hurdle rates should then vary "as a function of the type of project being considered" (Poterba and Summers 1995, p.46). In Jagannathan et al. (2016, p.4), of those companies using hurdle rates, 74.4% state that it represents company's WACC, few use company's leveraged cost of equity, and even fewer the unleveraged cost of equity. 73.5% of the respondents in Graham and Harvey (2001, pp.201) use the CAPM, followed by the average stock return and multifactor models. A few companies also use the yield from the Gordon growth model. Large companies are more likely to use the CAPM than small ones, public companies more so than private ones. Smaller companies often use target rates provided by their investors. Jacobs and Shidasani (2012) find that the techniques to estimate the hurdle rate vary widely between large companies. For instance, regarding the risk-free rate, 46% use the 10-year rate, the remaining companies use rates with different – both longer and shorter – maturities. 70% of surveyed companies adjust company's hurdle rate for project's differing systematic exposure, but only half of them do so by using the pure play approach. The rest make either arbitrary adjustments or none at all.

While large companies make project-specific adjustments, smaller ones often apply the company-wide hurdle rate to all their projects (Graham and Harvey 2001, p.209). For the venture capitalist funds surveyed by Dittmann et al. (2004, p.621), only a few of those who state that they apply discounted cashflow methods seem to use the CAPM or the WACC for the hurdle rate. Manigart et al. (2000) provide similar empirical evidence on the use of subjective investment criteria.

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There is indication that managers often use hurdle rates that are substantially higher than company's cost of capital (e.g. Arnold and Hatzopoulos 2000, pp.617). Poterba and Summers (1995) report that investment managers sometimes adjust a hurdle rate "to correct for overly optimistic cashflow projections in the projects they are asked to consider". The hurdle rate does then no longer correspond to the WACC, but reflects the capital budgeting process within a company. Poterba and Summers (1995) also find some indication that hurdle rates for strategically important projects are deliberately lowered. Jagannathan et al. (2016) examine reported hurdle rates rigorously using historical return data to compute the WACC with the CAPM. They find that that the hurdle rates, while statistically significantly related to the WACC in the cross-section, are on average twice as large as the WACC.

Other Criteria

Graham and Harvey (2001, p.200) and Arnold and Hatzopoulos (2000) find that the payback criterion is very popular amongst investment managers. In the US, particularly small firms use it more frequently than the NPV and IRR (Danielson and Scott 2006, Exhibit 4). In the UK, the payback criterion has been used by 94% of the large companies surveyed by Pike (1996, Table 2), up from 73% in 1975. The payback criterion is thus more popular than criteria based on discounted cashflows. Graham and Harvey (2001) examine reasons for this popularity. Capital constraints seem to play no role. However, Graham and Harvey (2001, p.200) find that older, long-tenured managers without MBAs or equivalent are more likely to use the payback rule, which "suggests that lack of sophistication is a driving factor behind the popularity of the payback criterion".

A.4 Discrepancy between Recommended and Actual Investment Decisions Explained

The literature review has shown that while companies use investment criteria based on discounted cashflows, these are not the only, and often not the dominant, criteria. Further, whenever hurdle rates are used, these seem to be higher than the cost of capital. The literature has provided several – mostly complementary – explanations why this is the case. These explanations focus on flexibility, and constraints and market frictions because of hidden knowledge and action. Given these, the capital budgeting process becomes more complicated. As Baldwin and Clark (1994, p.84) observe: "Most top managers understood very well the limits of formal discounted cashflow analysis and used it as a 'partial discipline' within a more complex resource-allocation process. In their eyes, the impact of an investment on competitors, the organisation, and the capital markets equalled or exceeded the importance of DCF calculations."

Investment managers at lower levels of seniority within a company will not have such discretion and can experience restrictions imposed by a rigid formal capital budgeting process. They will then – whenever necessary – try to work "with the numbers on cost and revenue until the financial returns [are] satisfactory" (Baldwin and Clark 1994, pp.85). This relates to the observation of Poterba and Summers (1995) that companies reduce hurdle rates for projects that are seen as strategic.

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Textbooks focus in their treatment mainly on investments where cashflows are exogenous and cannot be altered by the manager in the future. However, for many companies, this setting is too restrictive. If managers know that future opportunities can arise, then they might be more cautious with their current investments. This can explain the use of hurdle rates above the cost of capital. The premium considers that current investments may make future investments impossible. Take again a parcel of land: once developed, it is costly to reverse this decision. Current development destroys the option to develop later when more information is available. A NPV (just) above zero will then be insufficient to indicate that current development is worthwhile. This reasoning can explain the use of high hurdle rates: Jagannathan et al. (2016, Table 6) confirm this empirically. Flexibility considerations can also motivate the common use of the payback criterion, see McDonald (2000). Chittenden and Derregia (2015) examine if firms adjust standard investment decision criteria to take flexibility into account. Their survey results indicate that this is the case. This is therefore empirical evidence that practitioners try to work with the numbers to make this criterion compatible.

If markets are imperfect, this will lead to financial and operational constraints. More projects require more staff and perhaps also more funds, all of which comes with transaction costs. Incorporating this in raised hurdle rates will be an indirect approach to take such costs into account. Jagannathan et al. (2016, Table 9) confirm that operational constraints help to explain high hurdle rates as do financing constraints. They do not find that manager myopia contributes to high hurdle rates. Career concerns of managers, however, do seem to contribute to high hurdle rates. While company owners should not care much about a company's idiosyncratic risk – because they will hold other assets – a manager's career depends on the success of that company. If a project has high idiosyncratic risk, then the manager will increase the hurdle rate. Short-term career concerns can also motivate the common use of the payback criterion, because it allows managers to pick projects that provide cashflows quickly and signal success. However, the researchers could not find empirical tests of this explanation.

A.5 Conclusions

The literature review reveals that investment practitioners apply hurdle rates when using the IRR, NPV, the profitability index, and – implicitly – cashflow capitalisation. However, the hurdle rates in practice are often higher than the cost of capital and are frequently adjusted to reflect aspects that managers believe are not considered sufficiently in the cost of capital. The recent academic literature has pointed out that such behaviour can be sensible. The decision criteria and their use in actual investment decision making as prescribed by investment textbooks often neglect the importance of capabilities-enhancing investments and the importance of investments in strategic settings. However, several of the reviewed survey studies also asked about the use of real option model and find that few firms used them.

One issue that is not really addressed in the literature is the impact of a market where the product is heterogeneous and high value – as in the commercial real estate market – making full diversification of specific risk very difficult and raising the significance and importance of individual property-level risk on firm-level cashflows. Even if this were the case, it is not clear that this would justify use of informal heuristic decision tools rather than the adaptation of the more rigorous cashflow, option and scenario models recommended by prior research.

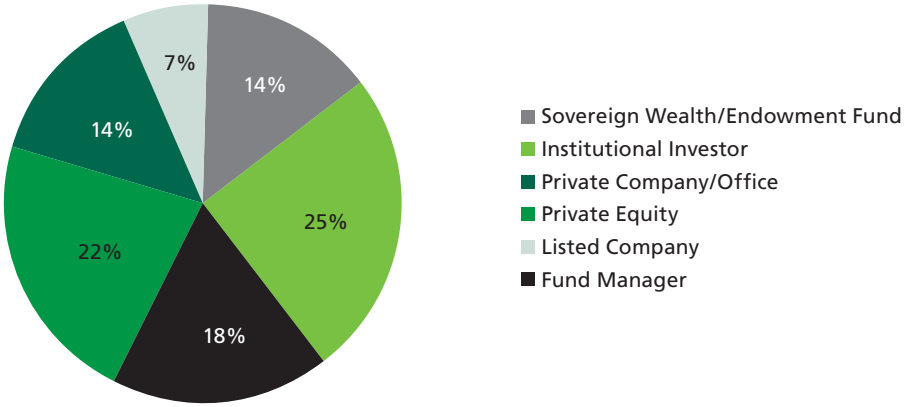
APPENDIX B: EVIDENCE FROM INTERVIEWS

B.1 Introduction and Methods

In this phase of the research project, the researchers conducted face to face interviews with 32 individuals from 27 firms and organisations active in the commercial real estate market, complementing the electronic survey with 56 survey responses. The aim of the interviews was to provide an overview of the processes and practices in investment and project appraisal in commercial real estate markets, exploring the basis and methods underlying specific capital budgeting decisions taken in organisations whilst the survey aimed to give a broader perspective on these issues.

The majority of the organisations were UK based but included the UK/European head office of international firms and the researchers also spoke to non-domestic firms and funds investing in the British market and included European firms investing in other European markets in the survey. By type of organisation, the sample included sovereign wealth funds (SWFs), institutional investors, public and private property companies, fund managers and private equity funds with a wide range of assets under management (see Figure B.1). The purposive sample was not meant to be statistically representative of the UK real estate market but, rather, to allow a clear picture of how decisions are made and the role that hurdle rates play in that process in different types of organisation.

Figure B.1: Distribution of Organisations Interviewed



Interviews were conducted using a semi-structured format, with broad topics including process (how buy/sell decisions are reached); methods (what decision tools were used); inputs (for firms using target rates, how were these arrived at; more generally what were the underlying models and assumptions used); adjustments (to what extent were hurdle rates or equivalent altered for specific individual assets); control (who 'owned' the analysis and could alter inputs); testing (what robustness checks were carried out); and international aspects (how the approach was applied in different markets). The semi-structured interview frame was developed based on material from the literature review and discussions at a focus group held in Cambridge in June 2016[11], as part of a long-term investor group seminar, where 10 senior investors from a wide range of organisations and nationalities debated target rates of return, yields and the interest rate environment. Interviews were conducted face-to-face with responses noted and transcribed. In what follows, the reseachers do not identify individual organisations or respondents, to preserve confidentiality.

[11] Note, this first focus group and some of the early interviews took place in the immediate aftermath of the UK referendum on EU membership, the result of which may have coloured respondents' views and attitudes.

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Given the semi-structured format and transcription process and the purposive (non-random) selection of respondents, the research cannot employ theory-free analytic techniques such as grounded theory (where the data forms the basis for the conceptual framework) nor use formal bibliometric analytic techniques. However, the researchers do use principles from such techniques to structure the analysis of the interview notes, in particular noting 'clusters' of techniques and processes. Before examining key topics in more detail, the following are some findings from initial analysis of the text in the transcripts:

- A dominant word cluster centred around assets, deals and, to a lesser extent, projects. This confirmed a general impression that project level decision-making is dominated by individual deals rather than broader strategic or portfolio considerations. To some extent, this is an artefact of the survey (in that hurdle rates and target rates are focused on those individual decisions) although interviewees were asked about portfolio considerations in their analyses. Although the researchers do not have bibliometric evidence for this, the individual focus does not seem to be related to size of organisation, with even the largest organisations being deal-focused.
- As partial confirmation of this, discussion of the (property) yield clustered strongly with risk, return and rate (target rate, hurdle rate). Given cashflow analysis at the core of decision models, this may relate to the importance of exit yield in any form of holding period models and entry yield as a determinant of price paid/capital invested for an individual property.
- Terms related to risk were recorded more frequently than those relating to return[12]. Risk clusters with return in discussions of trade-off between the two terms ("is the return adequate for the risk taken?"), but also with premium, where target rate was built up from a risk free rate and a risk premium. There was also a cluster around 'risk of loss' or downside risk – particularly for fund management organisations with a focus on not losing client capital. The context of the economic environment over the interview period, with significant uncertainty in political outlook and financial markets, is likely to have influenced this.
- In terms of process, fund was a dominant term: as discussed below, it was frequent that an organisation would have multiple funds with different target rates dependent on objectives (or, for funds with external equity capital, on client requirements). Sub-clusters of team, committee and paper reflect the dominant investment committee approval process.

The researchers develop these themes below under four main headings, examining: the processes by which investment decisions are reached; the dominant methods used; how hurdle rates or target rates of return are constructed; and the sensitivity and robustness tests applied to decision models.

[12] Strictly, it should be noted that the researchers recorded internal rate of return as IRR, which could temper this result. IRR appeared prominently, dominating any other technique-focused term.

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B.2 Processes and Responsibility

In overall structure, there is a common pattern to most of the larger and medium sized organisations interviewed whereby projects and deals under consideration are brought to a regular investment committee[13] for decision in the form of a report or decision memorandum. For smaller organisations and funds, some have the same structure but others have more informal procedures with individuals having delegated powers to accept deals (sometimes with a value threshold, above which a committee or board process is required). It seems evident that many investment committees have substantial power to ignore any formal decision rules: a typical example was "a deal which does not necessarily meet the performance criteria may be selected for other reasons". Equally, it is evident that often a substantial sorting and filtering process takes place before the investment committee meets or sees the decision memorandum: "the investment committee rarely declines proposals", "deals are rarely refused".

One key difference relates to ownership of elements of the investment report/decision memorandum. Generally, but not exclusively, the fund manager or investment manager seeking approval for a project prepares the report for investment committee. However, there are marked differences in the discretion that manager has in determining the inputs into the appraisal that is the core of the report. In larger organisations, those inputs are often (but not always) provided by a research, analysis or risk group or department; for some smaller organisations these may be outsourced or provided directly by the investment manager. In many cases, however, even where the inputs are provided by the research department, the investment manager has some discretionary capacity to adjust or augment the inputs. Depending on who was being interviewed these might be described as 'subjective alterations' or 'adjustments based on market knowledge and experience'. In some instances, research and/or risk departments were able to comment on adjustments and inputs as part of the investment committee approach. In others, the investment manager 'owned' the report in entirety. In a number of the larger organisations, there was a split between top down allocation guidance and bottom up stock selection: assets and deals had to be acceptable in terms of an overall investment framework, but the investment manager had more discretion with respect to individual deals, subject to overall criteria on risk and return, varying in formality.

The researchers detected some discomfort with strongly formalised decision processes and points of friction between investment and fund managers seeking discretionary powers and control and research, analysis and risk teams seeking to ensure a consistency of approach and validate inputs. This applied both to components of the cashflow and to hurdle rates or target rates (where these were used) or other decision rules. Some organisations had recognised that tension and implemented a 'dialogue process' whereby inputs and forecasts were proposed by the research unit (or equivalent) and then debated by a wider team (although it was not clear how disputes might be resolved). Another tension that might occur was where more complex, formal decision models clashed with the need for speed to complete a particular deal. In those instances, there were usually fast-track procedures and delegated powers. It would be interesting to explore whether there was back-testing to see whether the outcomes of fast-tracked decisions were comparable to those going through more formal processes.

[13] A variety of different names and structures existed: transaction committee, deals committee, acquisitions and portfolio committee and some had a variety of levels. For convenience of exposition, the researchers use investment committee as a common, representative term.

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For organisations that invested internationally, in many instances processes were common across jurisdictions, particularly for smaller organisations: for larger international organisations, some had common approaches across nations, others were structured regionally or nationally with differences in approach reported. The application of more formal, quantitative decision models internationally (and, to an extent domestically) is constrained by data availability, which affects the nature of the models that can be employed and the granularity of analysis (for example, less transparent markets may not have local city market sector data to inform cashflow forecasts, yield analysis or risk premia, necessitating a broader brush approach).

From the interviews, it appeared that the focus in investment committees was very much on the individual deal and its risk-return characteristics. Some respondents made explicit comment that the impact on the overall portfolio was considered as part of decision-making. However, in only a handful of cases was the portfolio impact central to the decision. Where the researchers were able to examine models in more depth, again these were largely focused on evaluation of project or building cashflows. Given that the focus of the research project and, hence, the interviews, was on target rates of return and hurdle rates in decision-making, this may be a reporting bias (in that respondents focused on individual asset decisions and underplayed portfolio-level measures), but further research could usefully explore this further. However, the deal focus was largely confirmed by the focus groups.

B.3 Decision Methods

Consistent with prior research, the dominant method in making capital budgeting decisions was the internal rate of return based on a discounted cashflow approach. While corporate finance literature emphasises the superiority of NPV in discounted cashflow (DCF) decision-making, just one organisation had NPV as central to the process. For some 70% of those interviewed, IRR was the primary decision metric. This should mean that each of those organisations has to be employing a target rate of return approach (since, formally, the buy signal is when the IRR is higher than the target rate), although a number directly stated that they were not. For those firms, a typical response was that the decision depending on "whether the return justified the risks posed by the project", suggesting some sort of informal, implicit and project specific acceptable return for particular types of acquisition or development.

For those where the IRR was not the primary decision, generally some form of metric approach was employed – equity multiple being the most common, followed by profit on cost or equivalent. These were most likely to drive decisions for smaller organisations and, in particular for private equity funds and developers, where avoiding loss of clients' capital appeared to be the major driver. A small number of larger firms with more sophisticated modelling techniques also focused on downside risk and loss avoidance – particularly where capital preservation was a key driver. This may be significant in understanding the investment decisions of non-domestic inward investors, particularly those motivated by safe haven factors where willingness to accept low returns or yields could be consistent with those assets having low probability of capital loss (and/or illiquidity). From a theoretical perspective, this would also be consistent with behavioural explanations of loss aversion. Equity multiples, however, would also be consistent with aggressive profit-driven investment motives, with implications for time-varying risks associated with particular multiple levels[14].

[14] That is, the risks necessary to achieve an expected 2x multiple may be much higher in a low interest rate, low return environment, particularly if leverage is constrained.

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The level of technical sophistication of modelling approaches used varied considerably across organisations. Some of those interviewed had substantial formal models and templates for conducting investment analysis with inputs from different departments and divisions. Such firms and funds typically also had a formal framework for specifying target returns, risk premia or other key elements of the decision process. This was less frequent, though, than more informal approaches that worked subjectively around a broad set of principles but with substantial discretion. Even where there were formal models, templates and frameworks, it was not clear how they had been derived or how consistent they were with standard approaches from financial theory and financial markets. Some appeared to have been developed historically (possibly with a formal research underpinning) and evolved over time; others drew more loosely on investment decision making and portfolio risk principles but with elements based on judgement rather than quantitative models.

Possible explanations for the low adoption of structured analytic models include the (perceived) difficulty of applying formal financial models to a complex, heterogeneous asset like real estate (allied to the lack of robust data to run such models in a thinly transacted private market); senior management reluctance to accept such approaches (the researchers did find indications of resistance even where there were formal models and also cases where formal models had been abandoned in favour of more individualistic appraisals); and gaps in the human capital needed to apply such models.

This last point is confirmed by a clear division between larger and smaller organisations with respect to modelling 'sophistication'. The researchers define sophistication as use of formal, theory-led, quantitative models, use of structured scenario or sensitivity analysis, strong research or risk department involvement in model inputs and, generally, more complex processes. An investment process that involved a formal forecast-driven cashflow model, a discount rate derived from asset pricing models and cost of capital, use of a structured sensitivity or scenario approach such as Monte Carlo simulation or similar to assessing downside risk and systematic processes for dealing with variations in risk and uncertainty across projects would be more sophisticated; one that was more reliant on metrics or on subjective variation of risk premia or cashflow inputs with minimal external involvement would be less sophisticated.

Larger firms were more likely to have research and/or risk analysis departments able to provide critical inputs for modelling work and had the economies of scale and flow of transactions to justify allocating resources to that process. Some large organisations had relatively informal structures while some smaller niche funds had sophisticated modelling techniques, albeit typically asset focused rather than market focused. The scattergram below sets a subjective assessment of modelling sophistication against size of organisation (by estimated assets under management). While making no claims about the robustness of the estimated ranking of modelling techniques, it does demonstrate a clear relationship between scale and sophistication[15]. Many of the smaller sized organisations are specialised private equity funds with approaches distinct and more deal driven when compared to those of the larger institutional investors or fund managers.

In many cases interviewees suggested a range of scenarios were considered and that the expected return and target return or hurdle rate (whether explicit or implicit) are assessed in the context of these scenarios. However, as discussed further below, there was generally a subjective or 'gut feel' approach taken to the probability of different outcomes rather than a clear framework for this analysis.

[15] The non-parametric Spearman correlation coefficient, at 0.703, is significant at the 0.01 level and beyond.

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The wider portfolio impact of transactions was considered in making decisions by some investors but this was normally a secondary consideration. Where portfolio fit was raised this was often in the context of being broadly in line with strategy or some potential optionality benefit. Specific analysis of the contribution of an asset to helping achieving objectives at a portfolio level in terms of risk and return was rare.

B.4 Hurdle Rates

Although a few of those interviewed suggested that they did not use a hurdle rate or target rate of return in making capital budgeting decisions most did have hurdle rates, whether explicit or implicit. One important distinction that emerged at an early stage of the research was between organisations investing on their own account (or with a large and diverse stakeholder group, as with listed companies or institutional investors) and those who were managing funds for client investors. In the latter case, where there was an absolute return target, this became the de facto hurdle rate. For funds with a relative return target (for example, to beat MSCI-IPD), then the target rate of return depended on expected or forecast rates of return (with a broad spectrum of approaches from formal forecasts at sector level to use of long-run averages or rules of thumb). A secondary (in some instances, primary) hurdle rate was the rate of return at which performance fees were payable (the preferred rate of return or promote/carried interest level). However, for most funds with an absolute return target and performance fees the assumptions that would deliver returns at or above the target level of returns net of all fees (significantly above the performance fee hurdle) was a key consideration.

Interviewees with external capital sources were asked how they set (absolute) return targets. Some were based on in-house estimates of achievable performance but a standard answer was that it was based on "the requirements of clients". This raises an important question which the research project design does not directly address: how do the client investors form those requirements and how do they move in response to changing market environments? Where this was addressed, there was a sense that the real estate funds were competing with other assets and markets and, hence, return requirements reflected expected performance from alternative assets. This, though, is a critical question: **do client expectations (and absolute return levels) shift appropriately with 'rational' expected market returns to capital, both debt and equity?** If the returns offered for core, value-add or opportunity funds remain relatively stable while bond yields, anticipated inflation and growth expectations fall, then this might be a signal of inertia, of stickiness in investor and fund manager behaviour.

For those organisations forming their own internal target rates of return, textbook models based on costs of debt and equity were conspicuous by their absence. Just one interviewee, unprompted, noted that their target rate of return was based on weighted average cost of capital. While some hurdle rates were based on average or typical returns in a market (with differing levels of granularity and differences between those forecasting and those using historic averages, split broadly between larger and smaller organisations), the dominant model was a 'risk free rate plus risk premium' model. That simple formula of Rf + RP, however, disguises a wide range of approaches, from simple rules of thumb to complex, layered models and pro-forma approaches.

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The Risk Free Rate

The risk free rate was, in almost all cases, based on Government bond yields: this masks substantial variation in how this was estimated. Ten-year bond yields were more common than other maturities (there seemed no clear match between the holding period for analysis and the maturity of the bond), some taking contemporaneous values, some using a moving average approach and others using 'stabilised' or 'normalised' rates. A number of those interviewed said that they had applied an adjustment because of low bond yields in the post-financial crisis/quantitative easing (QE) environment, reducing long run average yields or required returns. This seemed more driven by pragmatism (an inability to get deals to 'stack up' using historic target rates) than any formal model. Only one of the organisations interviewed explicitly discussed real bond yields, the majority seemingly using nominal yields. This raises questions about the treatment of inflation when historic yields, growth rates and average returns are being utilised in models and investment appraisals.

For those with international investment portfolios, there was a split between those using risk free rates from their domestic market (or benchmark currency for organisations offering, for example Euro denominated funds but based in the UK) and those using local, target market bond yields to proxy for sovereign risk and other systematic risk factors. Thus, two UK organisations might be appraising properties in Sweden using a risk free rate plus risk premium approach: the first bases their risk free rate on the UK 10-year gilt yield; the second uses a Swedish bond proxy. Applied correctly, the two approaches should give comparable results. The domestic (or benchmark) risk free rate is the minimum investment return required for the investor in that country, to which is added a risk premium. The difference between the risk free rate proxy in home and foreign markets reflects sovereign risk and systematic national factors (including differences in inflation expectations if the Rf is nominal). Thus the risk premium applied when using the foreign risk free rate should not reflect those sovereign and national factors but only systematic factors directly arising in the asset market. By contrast, if using a domestic Rf, the risk premium should incorporate both national and asset market factors. Operationally, it may be difficult to separate the two risk sources fully and there was some evidence of inconsistency in approach[16].

The Risk Premium

A number of the organisations using a Rf + RP approach provided details of how they arrived at their risk premia. Approaches differed greatly, from application of a single, property-wide risk premium to complex, layered approaches with multiple components. In only one interview was there an explicit discussion of leverage (with two separate cashflows, one geared, the other ungeared, and two separate discount rates with or without a leverage premium). Similarly, in only one interview was there an explicit discussion of inflation, with target rates and cashflows here being set out in real, not nominal, terms. Where figures were quoted, the core real estate risk premium ranged from 2.25% to 3.5%, that number seemingly coming from analysis of historic returns, from survey analysis, or from an 'in-house view'[17].

For those not using a single property-wide figure, there were different approaches to constructing risk premium, a wide variety of adjustments were applied: most considered sector and geography as the main dimensions, although there were substantial differences in granularity. Some explicitly considered volatility or liquidity of the sector or market segment. One respondent explicitly considered the segment's correlation with

[16] There were, for instance, examples of organisations using a foreign bond rate proxy for the risk free rate and then increasing the risk premium to factor in 'country risk' and/or using transparency measures that included systematic national risk factors. Care is also needed with inflation assumptions since differences between sovereign nominal bond yields in part reflect differential inflation expectations.

[17] It might be cruel to wonder whether the old valuation rule of 'gilts plus three' has a long run inertial influence on investment analysis.

APPENDIX B: EVIDENCE FROM INTERVIEWS

other segments, bringing a diversification dimension to the risk premium. Approaches varied substantially in sophistication, from explicit formal scoring frameworks and models to relatively ad hoc adjustment processes.

One major source of difference lay in the treatment of individual asset risk. Some organisations made no adjustments at property level at all (having perhaps accounted for sector and market differences); a few made relatively constrained differences. For most, though, individual characteristics featured highly in the construction of the risk premium: building quality and characteristics, micro-location, leasing and covenant factors were common features. In some instances, there was a formal process or scoring system for such adjustments; more normally this was a more subjective adjustment, made through group discussion. The correct theoretical stance here is not completely clear (other than that the discount rate should normally be the firm's WACC): the literature emphasises that application of a uniform WACC as a discount rate would be wrong for a firm with projects that had quite widely differing risk profiles. Equally, however, in a large firm, individual, idiosyncratic risk should be diversified away so the focus should be on systematic exposure to risk, not specific risk. This may be one way that real estate differs from the generic firm of corporate finance texts: smaller funds will have relatively few projects and hence will need to take more explicit account of specific risk. That said, some of the very largest investors still made detailed property level adjustments.

As noted above, organisations varied as to whether the risk premium estimation and adjustments were made by the investment team with an active interest in the deal or externally by, for example, a research or risk department. Larger organisations are more likely to have a research department but there was no uniformity here. Some of the larger, institutional, investors had devolved the process to the investment teams "to give a sense of ownership" although, in some of those cases, the research or risk departments had the opportunity to comment on assumptions made in papers to an investment committee or equivalent.

Other Approaches

A number of organisations used some form of average real estate return as a hurdle rate, either as the primary decision threshold or as a check where there was a client-driven or internal absolute return target. These varied substantially in granularity, from single rates for the whole asset class (usually for core, unleveraged property) to detailed market-sector numbers. Where market returns formed the basis they were typically based on historic averages although some funds used specific forecasts (this was most likely to be the case for funds with relative return targets such as beating MSCI-IPD by some margin). There was little discussion of the choice of time-period for historic averages and no discussion at all about adjustment for inflation expectations. In retrospect, the researchers should have probed more on this issue but the finding is consistent with the near universal use of nominal rather than real inputs in decision models.

There were few examples of other formal approaches to target rates with, as noted, only one interview discussing WACC. One institutional investor combined a long term core property return indicator with a CAPM-based return on equity from listed real estate, adjusted for leverage effects and liquidity, but that was the sole mention of a formal corporate finance theory-led approach. One other feature worth noting is that for many organisations, development projects were treated differently, typically with a single higher, required return threshold. This seemed to be fixed across markets and time periods: "development projects are expected to deliver returns of 15%". Some funds (typically smaller ones) seemed to be including a 'profit' component in cashflows alongside a raised target rate, which would appear to be double counting risk.

[18] Other similarly heterogeneous private market sectors do use real options models though: for example, the oil industry.

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B.5 Sensitivity, Scenarios and Robustness Checks

The researchers asked respondents about additional risk analyses conducted after or as part of the main decision analysis. In one instance, risk analysis was embedded in the decision-making process, with Monte Carlo simulation used to generate multiple potential outcomes and the ratio of negative to positive outcomes assessed. Such a structured approach was unusual. A small number of those interviewed said that they had used Monte Carlo approaches occasionally: one noted that simulation techniques had been used but had been dropped as it was felt the results were not superior to more informal methods. Similarly, the researchers found no use of (and little awareness of) real options approaches. Casually, embedded options were considered – for example, scenarios of potential change of use or permission to increase density were considered as part of an investment appraisal – but no formal usage. Some commented that they thought that it was too difficult to apply real options models to a heterogeneous and information-thin market like real estate[18].

By contrast, the majority of those interviewed did conduct some form of sensitivity analysis, usually in the form of testing the impact of varying inputs (with the principal focus being on exit yield and, to a lesser extent, rental growth). In discussing sensitivity, there was an apparent emphasis on downside risk (e.g. what if yields were to rise sharply?). Whether this asymmetry is a reaction to the global financial crash, its aftermath and the political-economic events around the interview phase is impossible to judge. Use of scenario analysis was common, if not as prevalent as for sensitivity analysis, with, again, an emphasis on downside scenarios. Consistent with the infrequent use of Monte Carlo techniques, there was little evidence of the use of formal quantitative risk analysis models using the sensitivity and/or scenario results in a quantitative or probabilistic framework – they were more employed as sense checks for the investment and fund management teams and the investment committee.

While this was not probed explicitly, the researchers note that these risk assessments are all ex ante. The research found little evidence of a systematic culture of back-testing: how robust or reliable were the models and approaches taken, how good were the forecasts, were there any systematic patterns to projects that generated poor results. Some (typically larger) organisations did indicate that models had been back-tested and that changes had followed from this – and to some extent, that often entailed simplifying models and giving more ownership to investment and fund management teams. It might be that the smaller number of projects and consequent closer personal knowledge of outcomes in smaller private funds means that an informal approach allows lessons to be learnt and embedded in decision-making processes.

B6 Conclusions from the Interviews

The interviews conducted for the project provide an in-depth insight into the investment decision processes of a wide range of organisations based in, or operating in, the UK commercial real estate markets. Practices differ substantially across organisations, in part related to the size of the firm or fund, in part to the focus of activity. Some common features occur, however. First, decisions focus significantly on risk at individual asset level (with asset level return seen as being needed to compensate for that risk) and less on the overall impact on the portfolio or organisational cashflows. Second, there is a substantial element of 'subjective adjustment' of model outputs and limited formal reliance on the results of quantitative models. Third, and as a corollary, market practice rarely conforms closely to textbook models from corporate finance.

In terms of decision-making process, the standard approach was that a paper was presented to an investment committee (or equivalent). That committee typically had strong discretionary powers but there was a sense

APPENDIX B: EVIDENCE FROM INTERVIEWS

that these were exercised rarely, that deals that reached this stage were not often rejected. It may be that this reflects a prior process of filtering and selection and early discussion, to ensure that formal proposals were likely to be acceptable. This prior stage might also allow for consideration of portfolio impacts: the deal itself needs to be acceptable but would not be brought forward unless it met portfolio criteria.

There were substantial differences between organisations in the control of the paper to investment committee: in some cases, the investment or fund manager 'owned' the paper, inputs and adjustments; in others separate functional divisions (research, risk, treasury, portfolio) had the opportunity to comment independently. This was related to, but not fully explained by, size of entity. Where there was formal external input, there could be tension between the investment manager (seeking flexibility and discretionary powers) and the research or risk units stressing the importance of formal model outcomes.

In terms of method, discounted cashflow was standard but not universal. Consistent with prior literature, in DCF, internal rate of return dominates net present value as a decision tool (the latter hardly mentioned). Many organisations employed metrics and heuristics either as an additional check or as the main decision-making criterion. Use of metrics was more common in smaller funds and in private equity. There were substantial variations in the technical complexity and formality of decision models but even in the largest organisations there seemed limited use of advanced quantitative techniques and substantial reliance on subjective/ judgemental adjustment and on market experience and expertise[19].

In terms of hurdle rates/target rates of return, a major difference emerged between 'firm-type' organisations, where the target is internal, and 'fund management-type' organisations, where targets may be fund specific and are formed in relation to the expectations of client investors and rival offers of competitors. In this latter case, the promised rate (and the promote rate) forms the key target for analysis. The research explored how fund managers sought to identify the offered returns through the focus groups (see below). For the former, there was little evidence of a formal weighted average cost of capital approach. Rather, core hurdle rates reflected a risk free rate plus risk premium approach or were based on historic or forecast returns, perhaps deriving from more traditional property valuation approaches.

For both risk free rate and risk premium, there was little consistency of approach across organisations. Where a risk free rate was estimated, the most common was a 10-year Government bond rate but this might be nominal or real; spot, forward or a stabilised historic average; and, for those with international holdings, might be purely domestic or vary by the country of a particular project. Some approaches seemed inconsistent in the way that 'country level' systematic risk and inflation expectations were handled (appearing in the risk free rate, in the risk premium and in cashflows without clear specification or separation).

There were significant differences in the ways in which risk premia (or expected returns) were adjusted across deals, with some organisations adopting a blanket 'property risk premium' but with most adjusting, with varying levels of granularity, for sector, country, market and also for property-level factors (quality, micro-location, covenant, lease). This re-emphasises the focus on the individual asset and on specific risk which is hard to reconcile fully with decision models derived from corporate financial theory. As noted in the literature review, projects where the manager has power to alter cashflows (that is, deals that might be characterised as value-add or opportunistic) may not fit with standard asset pricing, cost of capital approaches but it was here that adjustments based on market judgement were most prevalent. As before, larger organisations (particularly those operating across asset classes) were more likely to employ formal models and templates to determine a baseline target rate of return, yield or risk premium.

[19] The two are not synonymous!

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Most of those interviewed used sensitivity and scenario analysis, but this was rarely formalised (for example through assignment of probabilities to scenarios or through the use of simulation techniques). Rather, the emphasis was on downside risk – what might go wrong? This might relate to caution both with an uncertain economic environment and in the aftermath of the global financial crisis. However, it is also consistent with a view that, with larger individual deals representing a significant share of overall portfolio exposure, specific risk is important – that a deal that fails badly can have a very significant impact on overall performance of firm or fund. While this is more likely to hold for smaller and more concentrated funds, it seemed to be a general view and one that also justified the granular approach to determining risk premia. Since weights and probabilities are rarely attached to the scenarios, determining the significance of downside risks becomes a judgement call. The research found little evidence of back-testing of decision-models.

In summary, then, the interviews revealed substantial differences in the approaches adopted across different funds and firms but some consistent findings: an emphasis on individual project risk, infrequent application of formal quantitative decision-making models, the key role of client expectations and competitor offer for fund-management models and a strong reliance on adjustments to inputs and decisions based on judgement and market experience. Interviews suggested that hurdle rates derived externally in this way were 'sticky' – that is clients were reluctant to shift return expectations in a changing market context. One consequence of this is the risk for style drift, whereby a fund, seeking to maintain promised returns, moves up the risk curve either through financial engineering or by seeking out riskier assets and projects – or a combination of both. Differences emerged between firm and fund management types and by size of organisation but there was considerable common ground. Methods employed had more continuity with traditional valuation/appraisal practice than with techniques from the financial asset markets. As a result, decision-making approaches seem inconsistent with the recommendations of corporate finance theory, if more consistent with much of the survey evidence of practice in other sectors.

The researchers explored these findings and the extent to which they derive from the particular characteristics of the real estate market further in the focus groups, which are set out in detail in Appendix C.

[20] Since there are no robust statistics on the detailed composition of the commercial property market at organisational level (beyond highly aggregated ownership statistics by type of investor) there is no formal way to organise a quota-style sample or to reweight responses.
[21] Some organisations have multi-divisional structures with distinct approaches or functions.

ORGANISATIONS INTERVIEWED AND/OR PARTICIPATING IN THE FOCUS GROUPS

The research team is very grateful for the participation of the following organisations but emphasises that the findings are those of the research team alone and should not be taken as representing the views or position of any of the parties listed. The team also acknowledges all those who responded to the survey, while protecting their anonymity.

Abu Dhabi Investment Authority
APG Asset Management
Aviva Investors
Barings Asset Management
Benson Elliot
British Land plc
Cambridge University Endowment Fund
CBRE Investors
Cheung Kong Property Holdings
Cornerstone
Crown Estate
Deutsche Bank Real Estate
Fidelity Investment Managers
Gaw Capital
GIC
Grosvenor
Hermes Investment Management
Igloo Regeneration Fund
Internos Real Estate
Kames Capital
LaSalle Investment Management
Legal & General
M&G
Mansford LLP
Northridge Capital
Partners Capital
PGGM
PGIM
Quintain
Royal Institution of Chartered Surveyors
Savills Investment Management
Tesco Pension Fund
TH Real Estate
Tristan Capital Partners
Union IRE
Wellcome Trust
Willis Towers Watson

APPENDIX C: SURVEY EVIDENCE

Introduction

In this section, the researchers present results from the survey of real estate market participants in the UK and mainland Europe. The survey was intended to broaden the researchers' coverage of property market decision makers from the interview phase of the research, targeted at a wide range of investor types, including REITs and listed property companies, institutional investors, private equity investors, sovereign wealth funds and others. The results complement those of the interview phase in examining the processes, methods and models used in practice, the formation of hurdle rates and target rates of return, adjustments made to organisation-wide rates at sector, market and individual asset level, and what frameworks were employed to handle international investments.

C.1 Survey: Design and Sample Size

The survey questions were informed by the review of real estate finance literature, by the key issues raised in the first round of focus groups and by the early interview outcomes. The survey questionnaire was piloted to check for clarity and relevance and, after receiving feedback, the questions were amended prior to circulation.

The questionnaire was distributed by email to almost five hundred contacts who were known by the research team to be active in commercial real estate investment in UK and international markets. The aim was to provide as wide coverage as possible, rather than to attempt a representative sample of the whole market[20]; the sampling frame included more potential respondents from the European listed sector, since these had arguably been underrepresented in the interview schedules. The questionnaire was designed using Qualtrics software.

The survey took place during October and November 2016. 56 questionnaires were completed by participants from 48 organisations[21]. The participants included CEOs, CFOs, CIOs, directors, (co)founders, heads of research or investment, VPs, partners, analysts and fund managers with an average age of 40-49 and with 10-19 years' working experience. The organisation types consisted of endowment, sovereign wealth fund, charitable trust or family office (11%), pension funds (5%), REIT or listed property company (20%), real estate investment managers (43%), unlisted private property companies (13%), property developers (5%), and insurance company or operating partners (4%).

61% of surveyed organisations were UK-headquartered, with the remaining 39% based in international markets including Belgium (2%), France (2%), Germany (5%), Netherlands (9%), Switzerland (2%), Spain (2%), Singapore (2%), Hong Kong (4%), UAE (4%), USA (9%). The value of the organisation's real estate assets under management ranged from less than £100 million to more than £5 billion: 46% organisations had more than £5 billion in real estate investments, while 20% had £1 billion to £5 billion, 9% had £500 million to £1 billion, 16% had £100 million to £500 million and 9% had less than £100 million. The characteristics of the participants are summarised on in Table C.1.

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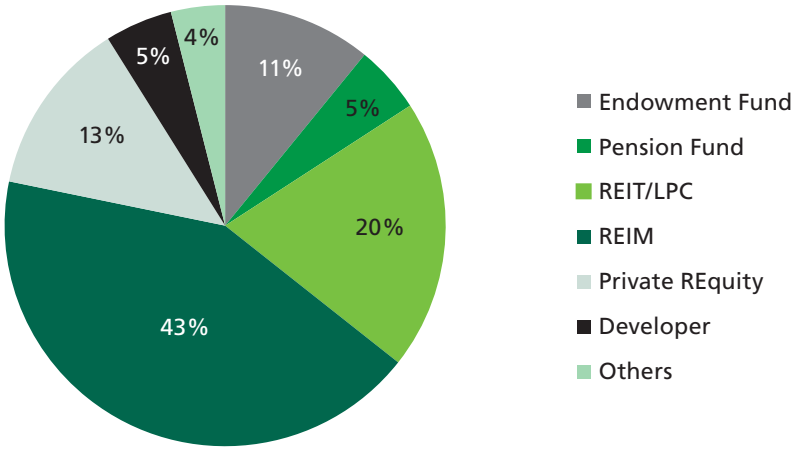
Table C.1: Characteristics of Survey Sample

Type of Organisation	% of sample	Headquartered	Value of Real Estate Investments
Endowment, SWF, Charitable Trust or Family Office	11%	Asia Pacific (5%), Middle East (2%), UK (4%)	<£100m (2%), £500m, £1bn (4%), >£5bn (6%)
Pension fund	5%	Mainland Europe (2%), UK (4%)	>£5bn (6%)
REIT or Listed Property Company	20%	Mainland Europe (15%), UK (6%)	£100m–£500m (2%), £1bn–£5bn (15%), >£5bn (4%)
Real Estate Investment Manager	43%	Mainland Europe (4%), US (9%), UK (30%)	<£100m (5%), £100m–£500m (9%), £1bn–£5bn (4%), >£5bn (25%)
Unlisted Private Property Company	13%	UK (13%)	>£100m (2%), £100m–£500m (4%), £500m–£1bn (4%), >£5bn (4%)
Property Developer	5%	Mainland Europe (2%), Middle East (2%), UK (2%)	£100m–£500m (2%), £500m–£1bn (2%), £1bn–£5bn (25), >£5bn (2%)
Insurance Company or Operating Partner	4%	UK (4%)	£100m–£500m (2%), >£5bn (2%)

Figure C.1: Survey Response by Organisation Type



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With respect to the organisation's principal investment objective, 59% of participants regarded providing a competitive return against benchmark/market/competitors as their main target (mostly real estate fund managers, who all selected IRR as their main hurdle rate approach), 11% selected maximising value of fund management business, 4% chose matching liabilities, and 5% selected all three objectives and emphasised that there are significant variations by fund. Other objectives were also proposed by participants: achieving best risk adjusted or stable returns, delivering long term real returns of at least 4%, meeting the need of investors, maximising returns for shareholders, achieving long-term rental growth, keeping dividend distribution stable, achieving income-based total return from assets, achieving a mix of absolute and relative returns and income distribution, getting profitable development opportunities, achieving a 20% return on equity and 2x multiple, long-term capital appreciation, and wealth preservation and income maximisation.

61% of participants reported that their organisations managed funds with different objectives, and 71% of this cohort used a hurdle rate for over half of their funds.

C.2 Investment Decision Tools

In this section, the researchers focus on the tools and models used by respondents to reach investment and capital budgeting decisions, seeking to identify any systematic patterns in variations in practice.

Methods

95% of participants responded that they used a hurdle rate (or a required rate of return) to inform them on the merits of a real estate investment, while 5% did not. The most and least frequently used tools are presented in Tables C.2 and C.3. The proportions of users to the total sample with respect to type, market and size are shown in the third, fourth and fifth column. Consistent with the findings from the focus group, the use of IRR dominated other decision tools to assess an investment: 93% of participants ranked IRR as one of the top three tools used (among which 66% ranked it as first), across different organisation types, markets, and sizes.

The second most popular tool selected by participants was return on invested capital: 68% ranked it as one of the top five tools they used for real estate investment decisions. It was (surprisingly) the primary decision for REITs/Listed PCs and REIMs, with a real estate portfolio valued between £100 million to £1 billion. The private PCs and developers were more likely to use this tool than Endowment/Sovereign Wealth and Pension Funds. The third most frequently selected tool was income on cost (59%). It drove the decision for more private PCs with smaller size (less than £500 million) than other tools.

NPV was only the fourth most frequently used (46%), which contradicts with its touted superiority emphasised in the corporate finance literature. It was primarily used by Endowment/Sovereign Wealth Funds and REITs/Listed PCs with large size (more than £500 million). The heuristic multiples were ranked as the fifth (41%), which were the primary decision tool for smaller sized (less than £500 million) private equity or PCs and developers. According to survey responses, the multiples can be TVPI, Total receipts/Capital invested, 1.3x plus, 1.5x, or 1.7x. Consistent with both the interviews and the survey literature reviewed above, then, smaller organisations are more likely to rely on metrics approaches than on the widely recommended discounted cashflow procedures. However, over half of the participants using multiples had more than £1 billion invested in real estate.

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Sensitivity analysis (55%) was the most important support for certain approaches. It was favoured more by Endowment/Sovereign Wealth and Pension Funds with more than £5 billion invested. This is consistent with the finding from the focus groups and interviews that the level of sophistication of tools is positively related to the organisation size.

Table C.2: Top Five Ranking of Most Frequently Used Decision Tools

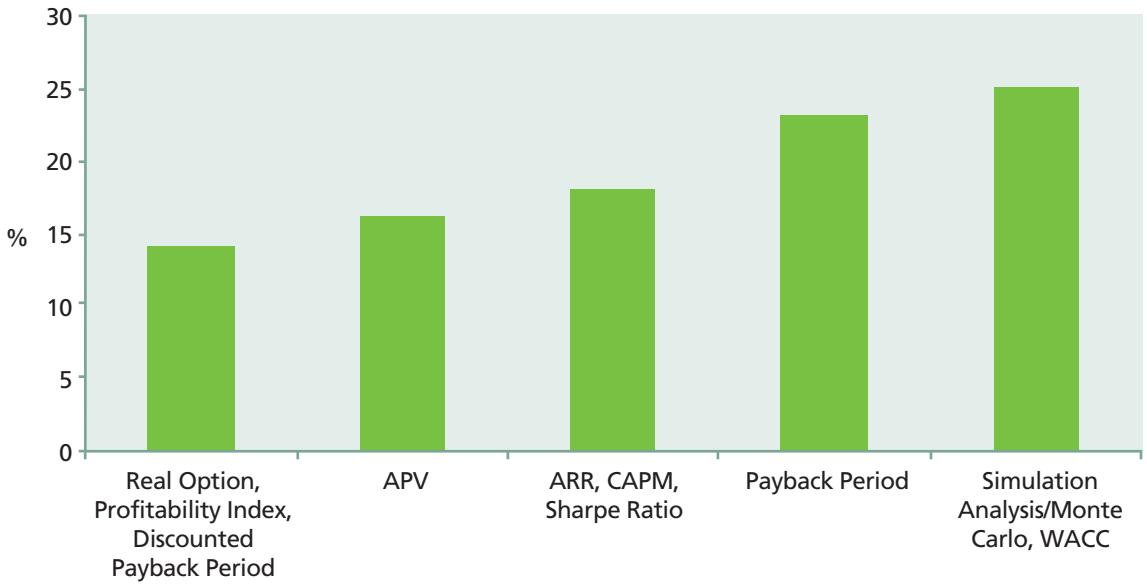
Tool		1. IRR (%)	2. Return on Invested Capital (%)	3. Income on Cost (%)	4. NPV (%)	5. Multiple (%)
Type (% in type)	Endowment/SW Fund	83	33	50	67	33
	Pension Fund	100	33	33	33	33
	REIT/Listed PC	91	91	73	73	18
	REIM	96	71	54	29	50
	Private PC	86	57	71	43	43
	Developer	100	67	33	67	33
	OC or IC	100	100	100	50	100
Market (% in type)	Mainland Europe	100	75	58	58	17
	Middle East	100	50		100	50
	Pacific Asia	67	33	33	33	33
	US	100	60	20	40	60
	UK	94	71	65	41	47
Investment Size (% type)	<£100m	100	40	60	40	20
	£100m–£500m	100	89	89	22	78
	£500m–£1bn	80	60	40	40	20
	£1bn–£5bn	100	91	91	64	36
	>£5bn	88	58	38	50	38
Total Usage		93	68	59	46	41

Table C.3: Top Five Ranking of Least Frequently Used Decision Tools

	Tool	Total Usage (%)
1	Real Option, Profitability Index, Discounted Payback Period	14
2	APV	16
3	ARR, CAPM, Sharpe Ratio	18
4	Simulation Analysis/Monte Carlo, WACC	23
5	Payback Period	25

APPENDIX C: SURVEY EVIDENCE

Figure C.2: Least Frequently Used Decision Tool



In line with the interview findings on the usage of more complex tools (confirmed in the focus groups), the real options approach was the least used technique, along with the profitability index and discounted payback period. The reason for such little application of sophisticated models was reported in the interviews and focus groups as being scepticism, unfamiliarity and the long time that has elapsed between learning the techniques and having the opportunity to implement them. CAPM and the Sharpe ratio were also rarely used.

The participants also reported on other tools that they frequently used, such as 'net profit', 'Rf + Rp', and cash-on-cash. The reseachers also examined the robustness of the choice of decision tools to the experience (≥10 years, or <10 years) and age group of participants, and found the usage of top five most or least frequently used decision tools remain unchanged. This could imply that the decision on the usage of the tool is determined at the formal organisation level rather than being individual-driven.

95% of participants use a target rate, among which 85% directly stated their use of a hurdle rate, and 10% implied their adoption of a hurdle rate for real estate investment:

- "An opportunistic investment strategy is implemented aiming at maximising IRR, and each investment will be assessed individually using a risk reward approach." (This is a relative hurdle rate, albeit informal.) (4%)
- "We acquire deals on an asset by asset basis and have individual deal target hurdle rates or exit prices" (This seems to be usage of a hurdle rate with an individual focus.) (2%)
- "Rates differ in various projects: long term growth versus short term." (This is the usage of variable hurdle rates with a style focus.) (2%)
- "Use initial yield or total return." (The latter is, presumably, an absolute hurdle rate.) (2%)

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5% of participants **did not** use a hurdle rate and they stated their reasons as follows:

- "We are long-term investors and focus on property fundamentals to judge whether an investment over a long period will yield income returns. The initial hurdle rates may not be the best way of judging the suitability of an opportunity." (2%)
- "Look at long term property fundamentals such as location, site configuration, longevity of design and materials etc." (2%)
- "Using a hurdle rate can lead to rejection of opportunities without all considerations being taken into account." (2%)

No systematic patterns have been observed across regions, or organisation types, or sizes for those claiming not to use a hurdle rate.

Adjustments to Hurdle Rates

80% of respondents applied ***a hurdle which was specific to individual projects or investments:*** 39% respondents used hurdle rates for individual investments, 18% used hurdle rates for individual funds/client mandates, 20% used hurdle rates for individual funds/client mandates and individual investments, 2% used a hurdle rate for the overall organisation and individual investments, and 2% for the overall organisation and individual funds/client mandates and individual investments. The larger organisations (with more than £5 billion invested), such as REIMs and Private equity PCs, were more likely to adjust rates on individual projects or investments than other types. Only 5% used a hurdle rate for the overall organisation. This is a somewhat surprising result: the larger the portfolio, other things equal, the more specific risk should be diversified away, suggesting a focus on systematic risk factors. Smaller funds with high exposure to individual assets might reasonably be expected to be more concerned about specific risk.

Table C.4: Adjustments to Hurdle Rates

Adjustment		Individual Project/Investment (%)	Overall Organisation (%)
Type (% type)	Endowment/SW Fund	67	
	Pension Fund	100	
	REIT/Listed PC	55	18
	REIM	92	4
	Private PC	100	
	Developer	67	
	OC or IC	50	
Investment Size (% type)	<£100m	80	
	£100m–£500m	78	
	£500m–£1bn	40	
	£1bn–£5bn	73	9
	>£5bn	92	8
Total Usage		**80**	**5**

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With respect to how frequently the hurdle rate is adjusted, 20% participants adjusted the hurdle rate less than annually, 20% adjusted continuously, 14% adjusted whenever there was a major project or investment, and 14% adjusted quarterly. 14% participants responded that the adjustment frequency varied by mandate and assets held and was often more than three years[22]; or as hurdle rates were determined by their clients (the absolute rates of return demanded from a fund) they only adjusted the rate when changed market conditions meant that assets with the right risk profile could no longer be acquired; or ad hoc every 18 months. Only 4% adjusted annually, and 2% adjusted semi-annually.

The characteristics of the respondents – organisation types, markets operated, size or participant experiences – did not systematically explain differences in frequency. Scale and transaction frequency might be expected to be an influence (in that smaller funds would tend to have fewer transactions, more irregularly timed justifying updates at the time of a deal, while a large organisation would have a flow of deals and, thus, be updating continuously. However, no such pattern was observed. In part, this may relate to the fund-client structure – a large fund management firm may have many funds, each with specific mandates and return offers, fixed for the duration of the fund.

The majority of organisations assessed the investment return over one to five years (46%) or a six- to 10-year (36%) time horizon, of which over 70% had more than £1 billion invested in real estate. 18% assessed the investment return over a longer than 10-year time horizon.

C.3 Process

In response to questions on the strategic decision process on the choice of hurdle rate, the majority of respondents acknowledged the role of an investment committee. 57% responded that the decision on whether to accept or reject an investment opportunity involved a central unit or board for the whole organisation. REITs/Listed PCs and REIMs, with mid to large investment size were more likely to adopt this approach for the decision making process: some 70% of listed companies and the REIMs in the sample had some form of central control. As found in the interviews, the respondents confirmed that, while the decision making process used input from research: "the decision is recommended by individual units and approved by the Board"; "the decision is made as follows: methodology set centrally, project specific hurdle rate set based on project-specific risks"; "Property sector level decision by Central Unit, adjusted for specific assets by individuals, reviewed by Directors"; "the decision is made by clients in consultation with the organisation". This confirms the impression that there is substantial individual manager ownership of the report to investment committee or equivalent (with substantial scope, therefore, for adjustment to both inputs and outputs). Only 23% reported that the decision was taken by an individual unit or department. It seems that private equity PCs with smaller investment size adopted this process.

Further information provided by participants seemed the imply the direct involvement of managers or clients in fund structures: "the decision is made by fund management research and investors, or opportunities"; 'the decision is made by investors and they decide on whether it's achievable when starting mandates and execute accordingly"; 'the decision is made by clients"; "the decision is made in their limited partnership deeds which determine what they offer to third parties for new investments"; "the decision is made as ungeared plus 1% or 9%"; "the decision is made by private equity owners". This presents a somewhat confused picture which presumably relates to specific vehicle structure. For example, it cannot really be the case that investors in a

[22] Presumably this would be linked to the end of a finite life fund with a specific return offer as, for example, with an absolute return fund or with a fixed promote threshold.

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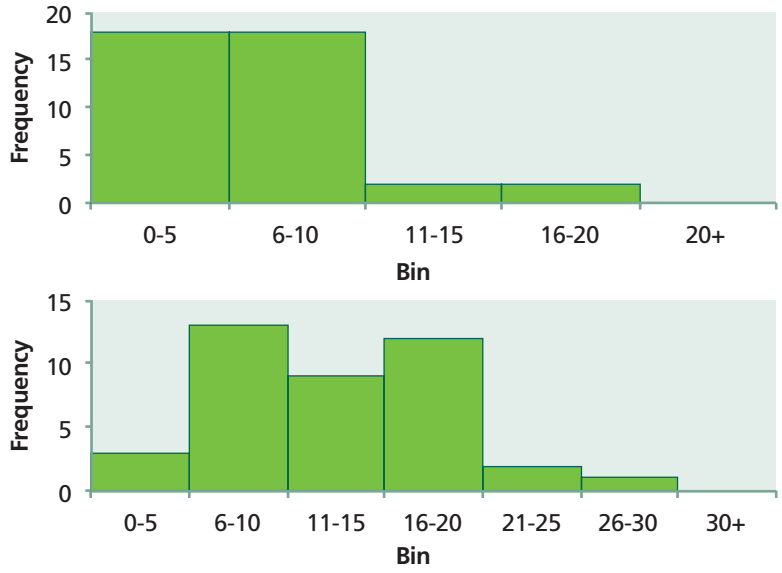
limited partnership structure 'make the decision' – since they would then lose their protected limited partner status – and in most funds there is agreement between the equity investors and the fund manager as to the type of asset sought and the returns promised, but the manager would normally have discretion over deals themselves (perhaps up to a threshold value or share of the fund).

Consistent with individual asset-level adjustment of the hurdle rate, 41% "always" or "frequently" used a hurdle rate for a specific fund or mandate, whereas 43% participants claimed they "never" or "rarely" used an organisational level hurdle rate. Other 'non-standard practice' elements were detected: 45% "always" or "frequently" used a hurdle rate for the relevant property sector or market, and 48% "always" or "frequently" used a hurdle rate which was specific to each investment. 4% participants replied that they also used a currency specific hurdle rate, and a programme hurdle agreed at the outset of a JV or fund. 50% participants advised that they "never" or "rarely" use organisational-weighted average cost of capital, and 36% reported that they "never" or "rarely" used a country specific hurdle rate. This last finding is inconsistent with the interview findings, where nearly all of those with international portfolios adjusted for sovereign risk (through the risk free rate), market risk (through the risk premium) or both.

68% of participants stated that their organisation used several hurdle rates (over half with more than £5 billion invested in real estate), whereas 18% reported that their organisations only used a single hurdle rate. Among the participants who reported using hurdle rates, 68% specified the single rate or multiple rates they used. The majority of participants used hurdle rates with the lowest rate being between 1 and 20% and the highest between 4.5 and 30%, mostly from REIMs with more than £5 billion invested (the histogram of the range of hurdle rates is shown in Figure C.3). For organisations with multiple hurdle rates, those with competitive return as their principal objective have higher average hurdle rates than the ones with other objectives.

Figure C.3: Histogram of Range of Hurdle Rates



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In terms of the capital structure decision for organisations, 84% "always" or "frequently" or "sometimes" preferred current cash (over 70% have more than £1 billion invested); 80% "always" or "frequently" or "sometimes" chose long-term debt (over 60% of those have more than £1 billion invested); 43% preferred short-term debt (over 70% of those have more than £1 billion invested); 25% "always" or "frequently" or "sometimes" chose equity issue, to finance a new investment[23]. 52% "never" or "rarely" used anticipated profits, and 52% "never" or "rarely" chose equity issues to fund investment. These findings are broadly consistent with pecking order theory and standard corporate finance models, in contrast to the results on the decision-making models and metrics. Other sources of finance are also indicated, such as equity from funds[24], mezzanine debt, JV partner equity, or client's committed capital directly. For organisations with multiple hurdle rates, the ones relying on long-term/short-term debt as source of finance have higher average hurdle rates than the ones using current cash and equity issue. This would be consistent if the hurdle rate relates to return on equity (since increased leverage increases the risks for equity holders) but not in a WACC context.

When making an investment, 48% of participants separately assessed the unlevered project cash flows/returns and then decided on the mix of capital (mostly large sized Endowment/SWFs and REITs/Listed PCs with more than £500 million invested), which follows the standard corporate finance model. However, 29% assessed the investment cash flows or returns with the capital funding costs included (more likely to be smaller sized REIMs). This could be consistent with a flow to equity approach if the hurdle rate applied is an equity only rate. The remaining 23% suggested different views on the treatment of leverage:

- they assessed the total investor return as: all leverage + fee/costs accounted for;
- both cases were accounted for, depending on funds with the standard amount of leverage or with equity only. The ungeared one dealt with fundamentals, the geared one ensured that they did not devote capital to unnecessarily equity hungry projects;
- for those not using leverage, they always assessed the 20-year unlevered cash flow.

C.4 Hurdle Rate Drivers

Inputs

The respondents revealed a range of practice as to how the hurdle rate was calculated. 41% of participants adopted a fixed target rate of return, determined by fund managers for clients. 32% of respondents said they explicitly set relative return targets, among which 18% used a bond yield or risk-free rate plus a risk premium, 14% used a property yield plus a risk premium.

Other approaches to build up the return target also mentioned were:

- "simulation approach to assess parts of the risk premium";
- "real bond yield plus expected inflation and risk premium";
- "for ungeared: IPF consensus (five-year) plus 1% outperformance objective;;
- "for geared: a function of this plus debt at the time";
- "fixed plus cost of capital, depending on the mandates";
- "WACC plus risk premium"; and
- "fund level minimum return plus risk premium".

[23] Strictly, in those terms this is a route only available to the listed firms so evidently it has been interpreted more generally as equity raising by a number of respondents.

[24] Presumably equity commitments from the clients of the fund, to be drawn down when needed.

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These responses might suggest a lack of structured rigour in the determination of target rates. It is not clear, for example what "WACC plus risk premium" implies since both the cost of debt and cost of equity contain premia for the risk of the firm's activities and capital structure, unless this refers to adjustment for risk at project level. Similarly, "fixed plus cost of capital" is opaque.

29% of the participants used a 10-year nominal UK government bond yield while 13% used a 10-year real UK government bond yield, as the risk-free rate for UK investment. The 'rarely used' proxy for the UK risk-free rate was: a five-year average UK government bond yield (2%), one-year bank rate (2%), swap rate (9%), and five-year nominal UK government bond yield (7%). This is broadly consistent with the interviews, although a number of those interviewed suggested using forward rather than spot Government bond yields and referenced corporate bond yields. There were other risk-free rates suggested by participants: average base rates, LIBOR, a rate defined by management board, the local government bond rate, three-month cash interest rate. Of those specifically using Rf as part of their hurdle rate, 42% 10-year nominal UK government bond yields, 17% used a 10-year real UK government bond yield, 17% used a five-year nominal UK government bond yield, and 24% used the swap rate or a three-month interest rate. As for international organisations using Rf in their target rate for UK investment, the 10-year nominal UK government bond yield and swap rate was the most frequently used as the risk free rate.

Expected future inflation was accounted for by 58% of the participants who used a hurdle rate to evaluate an investment.

When adjusting for increased investment risks, 45% of participants increased the hurdle rate, whereas 16% decreased the estimated cash flows. 32% chose to do both and, perhaps disturbingly, 7% decided to do neither.

48% of the participants responded that investing in a new real estate sector would lead to a higher hurdle rate. 29% thought that a short-term investment would have a higher hurdle rate, while 23% participants thought that a foreign investment or long-term investment would lead to a higher hurdle rate.

The top five most likely risk factors which would affect the hurdle rate were: stage in the property cycle (61%); change of interest rate (59%); individual building or tenant characteristics (57%); the state of the local property market (48%); and the general location of the building (macro/national/regional) (43%).

Regarding the risk premium component, the top five "always" or "frequently" considered risk factors were: real estate sector risk (70%); rental growth risk (61%); covenant risk (59%); yield shift risk (54%); and liquidity risk (52%). The "least" or "rarely" considered risks are the depreciation and country risk. There were other risks suggested by some participants, including construction cost and timing risk, execution risk, void risk, inflation risk, and security of payment. Among the organisations where adjustment is made to the hurdle rate at individual project or investment level, the risk factors "always" or "frequently" considered remain robust: real estate sector risk (79%), rental growth risk (68%), covenant risk (66%), yield shift risk (62%), liquidity risk (60%), lease length risk (55%), and country risk (53%). As for the organisations with overall organisation rates, the top five risk factors contributing to that rate were: real estate sector risk (80%), covenant risk (60%), yield shift risk (60%), liquidity risk (60%), and depreciation risk (40%). This, though is a small sub-sample.

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For large organisations with more than £5 billion of real estate assets under management, the real estate sector specific elements, such as sector risk, covenant risk, rental growth risk continued to be reported as important. As noted above, this suggests a divergence from the literature on diversification theory since, with large portfolios, specific risk should be less significant. This might imply that practices in the real estate sector differ from the general financial market or the precepts of corporate finance theory.

C.5 Foreign Investment

To incorporate currency risk, 25% of participants discounted the foreign currency cash flows using a hurdle rate specific to that country or specific investment, 21% translated the foreign currency cash flows of the project into home currency by using forward rates and used the domestic hurdle rate. The other participants responded that this was either not applicable as they did not have foreign investments, or they:

- used a basket of currencies as part of a global balanced portfolio;
- implemented a strategy of underwriting in local currency but looked at foreign exchange risk separately;
- made a decision on currency hedging based on a fund's risk appetite;
- used benchmark rates at the start of each year;
- raised funds in foreign currency and appraised opportunities in the foreign market, to avoid currency fluctuation

The first two of these suggest the use of a currency overlay strategy which was also cited by larger, typically multi-asset, organisations in the interviews. Smaller funds and real estate specialists might need to approach hedging and currency risk more directly at project level.

As for the risk level for foreign projects, only 16% used higher hurdle rates and more conservative cash flow estimates than for similar domestic projects. The remaining respondents on this topic specified individual risk assessments approaches to foreign investment:

- the risk depends on the market/country they invest in;
- the risk depends on the investment's merits rather than country;
- the risk depends on cities and not on countries. Specific retail quality of a street/building is most relevant. No increased risk incorporated in the hurdle rate for foreign investments, unless absolutely clear added risk; the risks are independently derived based upon country/sector specific risks, thus could be higher or lower;
- the risk depends on foreign real yields, foreign expected inflation, foreign risk premium, and assumed exchange rates;
- the risk depends on the source of capital ;
- the risk depends on the rates bespoke to the investment appraisal;
- the risk depends on the likely projected returns and investor appetite for the strategy. This reveals a range of practice, some following rational financial and economic principles, some apparently not. It is hard to see, for example, how risk can depend on investor appetite. Risk tolerance clearly varies across investors and there should be a relationship between expected risk and return which should direct investors to particular vehicles and products. This though does not generate the risk of a project. There also seems to be some risk of double counting (for example, in the relationship between (relative) expected inflation and currency movements).

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30% participants used the target country's nominal bond yield as the basis for the hurdle rate, and only 7% used the real bond yield. The rest used other rates for the basis, which included the absolute return demanded by (or promised to) the investor, rates based on foreign fund returns and investor view, rates adjusted based on CDS spreads, and a three-month cash rate.

C.6 Impact of EU Referendum

Since the initial focus group and the interviews took place in the context of the investment markets reactions to the June 2016 EU referendum result in the UK, with those reactions colouring responses, the researchers included a specific section on the referendum result. As a consequence of the Brexit decision, 68% of respondents recorded that their hurdle rate was unchanged, while 14% reported that they had increased hurdle rates. Only 4% responded that the hurdle rate had decreased, arguing that, for relative return clients, the required return uses the forecast return for all property as the reference point to assess under- or over-pricing Brexit reduced the return expectations, so, by implication, the required return had fallen. The following reasons were given as contributing to an increase in the hurdle rate:

- the range of uncertainty around market growth had widened;
- for international investors, there is greater risk associated with investment in the UK;
- higher hurdle rate to compensate for the uncertainty around market liquidity and potential value depreciation;
- long-term economic uncertainty in near term;
- greater perceived risk due to short-term volatility in the UK (one to three years), and likely reduction in rental growth in the medium term.

It should be noted that these are responses in October and November well after the initial market reactions to the referendum result (with open ended funds gating their funds and marking down NAV sharply in response to fears of outflows). The early interviews and the first focus group took place in the earlier period but revealed very similar views.

C.7 Summary and Conclusions

The survey explored investment practice with over fifty respondents from a wide range of property types, sizes and locations. The results are broadly consistent with the findings from the interviews and suggest a wide range of practices across the UK (and European) real estate industry, many of which do not conform to standard corporate finance theory and which, in places, seemed inconsistent. It was hard to find explanatory factors for differences in practice beyond the firm-type/fund-manager type distinction discussed earlier. In the latter case, clients and competitors played a key role in determining the returns offered by funds which, in turn, formed the baseline target rates of return in analysis.

Some 95% of respondents reported that they used a hurdle rate in some form. In terms of decision making rules, as in prior survey evidence, IRR dominates market practice. NPV – the recommended technique for standard projects in finance theory – only ranks fourth behind two metric approaches, return on capital and income on cost. Smaller firms and funds were more likely to rely on metric approaches than the largest organisations; the largest organisations were more likely to use NPV although some of the differences in adoption are marginal.

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There was limited evidence of use of advanced quantitative techniques such as real options analysis, probabilistic scenario modelling and similar, even where these might fit well with the projects under consideration. Similarly, few reported using formal asset pricing models, either in analysis or as a basis for establishing cost of capital, with only CAPM appearing in a few of the survey responses. Some use was made of Monte Carlo simulation in a minority of, typically larger, funds.

Well over three quarters of the sample analysed and set hurdle rates at individual project or asset level. Again, a wide range of approaches were reported in relation to calculating hurdle rates. There is a split between fund-type structures (here, client demands and competitor offers acted as a constraint and steered the fund managers to particular absolute return targets) and firm-type structures. In the latter case, there seemed more reliance on a risk free return plus risk premium approach that seems more aligned to, or derived from, conventional yield based valuation techniques than to a more formal cost of capital approach as advocated in finance textbooks. Similarly, there seemed to be a wide spread of practice in terms of the frequency of update of hurdle rates (some constantly updated, some created for specific projects, some barely moving over time) and over the time horizon for analysis. Vehicle structure explains some, but not all of that variation.

The survey, then, in line with the interview evidence, shows a substantial divergence from recommended capital budgeting practice from the finance literature and a wide variation in models, decision tools and approaches. An emerging theme is the distinction between the idea of 'the firm' – the bedrock of corporate finance – and the fund structures which are prevalent in the real estate industry where fund managers gather equity capital from external investors whose target rates of return (and the alternative returns offered by other funds and managers) shape the returns offered, the assets sought and the capital structure. While this can be shaped to conform to finance theory (through a flow to equity approach), it seems evident that clients and competitors do shape hurdle rates and affect the decisions taken.

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Aberdeen Asset Management	LaSalle Investment Management
ADIA	Lightstone Properties plc
Alstria Office AG	M&G
APAM Real Estate	M7 Real Estate
Aviva Investors	Meyer Bergman
Befimmo SCA	Old Park Lane Management Ltd
BlackRock	Oxenwood Real Estate LLP
Brydell Partners	Paloma Capital
C2 Capital	Patrizia
Canmoor Asset Management	PGGM Investments
Crown Estate	Pramerica Financial
Dexterwood	Primary Health Properties
DTZ Investment Management	PSP Swiss Property AG
Dubai World Trade Centre	Quintain Estates and Development
Eurocommercial Properties NV	Stanhope Plc
GIC Real Estate Intn'l Pte Ltd	TH Real Estate
Grosvenor	Townsend
Hansteen Holdings	Standard Life Real Estate
Hearthstone Investment Management Ltd	Union Investment Real Estate GmbH
Hermes REIM	Vastned
Howard Ventures	Wereldhave NV
Inmobiliaria Colonial S.A.	Westate Investment Management Ltd
Kingfisher Property	Westmount Real Estate
Land Securities Group	Züblin Immobilien Holding AG

The research team would also like to acknowledge the responses from a number of organisations wishing to remain anonymous. Note: some organisations with divisional structures and functions provided multiple responses.

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