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Alex Moss

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Category classification



Performance

The sector can be tracked, on a daily, monthly and annual basis since data is accurate and readily available.



Inflation hedge

Evidence over the long term - listed real estate protects your investment against inflation.



Correlation

Long-term performance trends and relationships between the investment asset classes.



Sustainability

The implications of green practises, reporting and investor demands on the property sector.



Asset insight

Analysing the performance of real estate strategies which vary by asset type, location and vehicle.



Allocation

Strategic investment reasoning behind allocations between the various asset classes.

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Long-term impact of ETFs on
the listed real estate market

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December 2017



Keywords: ETF ownership, investors, fund managers, real estate company executives

Leading research institution:

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1 Long-term impact of ETFs on the listed real estate market

Executive summary

ETF ownership has reached 11.8% in real estate stocks globally and 23.6% in the US, making ETFs meaningful shareholders of the listed real estate market. Market participants expect ETF ownership to reach 50% in the near-term future, raising questions about the impact of this relatively new type of shareholder. This paper examines the long-term impact of ETFs on the listed real estate market. First, we survey the literature discussing the impact of ETFs on financial markets. Second, we provide a brief overview of the evolution of the passive ownership in real estate stocks. Third, we discuss the long-term impact of ETFs on the listed real estate market. In contrast with research on general equities our empirical results do not indicate that higher ETF ownership has a negative impact on real estate stocks from a market structure perspective; however, we believe this likely due to a limited sample size of available stocks in the listed real estate market. We discuss the long-term impact of ETFs on the listed real estate market, which is positive for investors, negative for fund managers, and somewhat neutral for real estate company executives. We highlight that for active fund managers a path for survival is to become increasingly activist shareholders. ■

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Share repurchases
and special dividends

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December 2017



Category: Performance

Keywords: firm valuation, transparency, investment strategy, performance

2 Share repurchases and special dividends

Executive summary

Share buybacks and special dividends are common financial management tools that can serve a number of purposes in particular communicating unwarranted low stock prices or create more value for shareholders. This research is of interest to both fund managers and investors in REITs. REIT managers use share buybacks to signal confidence in the future of the firm and get more for their money when prices are unjustifiably low. Special dividends and a record of paying special dividends signify good performance and focus on stability with investors benefiting from good fortunes. The research paper investigates the impact of these programmes on announcing firm stock prices and NAV and assess whether these programmes are worth pursuing. We find evidence of a positive reaction of stock prices to share buybacks lasting though for no more than a month. The impact is assimilated fast but still managers have successfully signalled their beliefs. In the long-run, firm fundamentals matter. The research does not establish similar effects on firm performance from special dividends. REIT managers should expect scrutiny when share buybacks are announced. Not all investors are convinced. REITs should make clear the motivation and in particular why cash is not used for further investments. The market will applaud such moves if further investments are considered too risky. Hence investors are relieved to learn that companies do not intend to use funds to take on higher risks and instead return cash to shareholders. ■

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Debt diversification in
the real estate companies

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December 2017



Category: Performance

Keywords: cost of debt, investment ratio, returns, credit supply constraints

3 Debt diversification in the real estate companies

Executive summary

In this paper, we analyse how debt diversification, that is the diversification of the company's debt into several sources and instruments of debt, affects the performance of European listed real estate companies. More specifically, we analyse how debt diversification affects the company's cost of debt, investment rate as well as its performance on stock market. We look at these effects in presence of credit supply constraints.

We construct a debt diversification measure by normalizing the Herfindahl-Hirschman Index using the debt type data. Our data indicates a strong reliance on private borrowing. Although, this trend is decreasing.

Our results suggest that debt diversification is associated with lower cost of debt for REITs. The finding is aligned with our hypothesis that REITs benefit more from debt diversification than REOCs due to their regulatory framework that makes them more reliant on external financing. In addition, we test the effect of debt diversification in presence of credit supply constraints. We find that having a diversified debt structure during tight credit supply periods is associated with lower cost of debt. That is, companies with diversified structures have the opportunity to obtain cheaper debt in presence of credit supply constraints.

A second important channel through which debt diversification can affect company performance is investment. Listed real estate companies, and especially REITs, are dependent on debt financing in their acquisitions, and thus having a diversified debt structure could lead to competitive advantages if the companies are able to seize

opportunities when their competitors face credit constraints. Our results support this hypothesis. In the presence of credit constraints, companies with more diversified debt structure have significantly higher investment ratios.

We then turn to analysing the effect of debt diversification on the performance of the stock of the company. We find only weak evidence of positive association between debt diversification and higher total returns on real estate companies stocks. This indicates that the benefits obtained through lower cost of debt and higher growth prospects do not necessarily translate into higher stock returns.

These results are interesting from a company management point of view since diversified debt structure provides benefits to listed real estate companies through lower costs of debt and an independency from single lending source.

From an investor perspective, investing in real estate companies with diversified debt structure is advantageous since they have better abilities to seize investment opportunities particularly in presence of tight credit supply. ■

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The interest rate sensitivity
of public real estate

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June 2017



Category: Inflation hedge & Performance

Keywords: interest rates, return, risk, beta, debt maturities, occupancy rates, duration

4 The interest rate sensitivity of public real estate

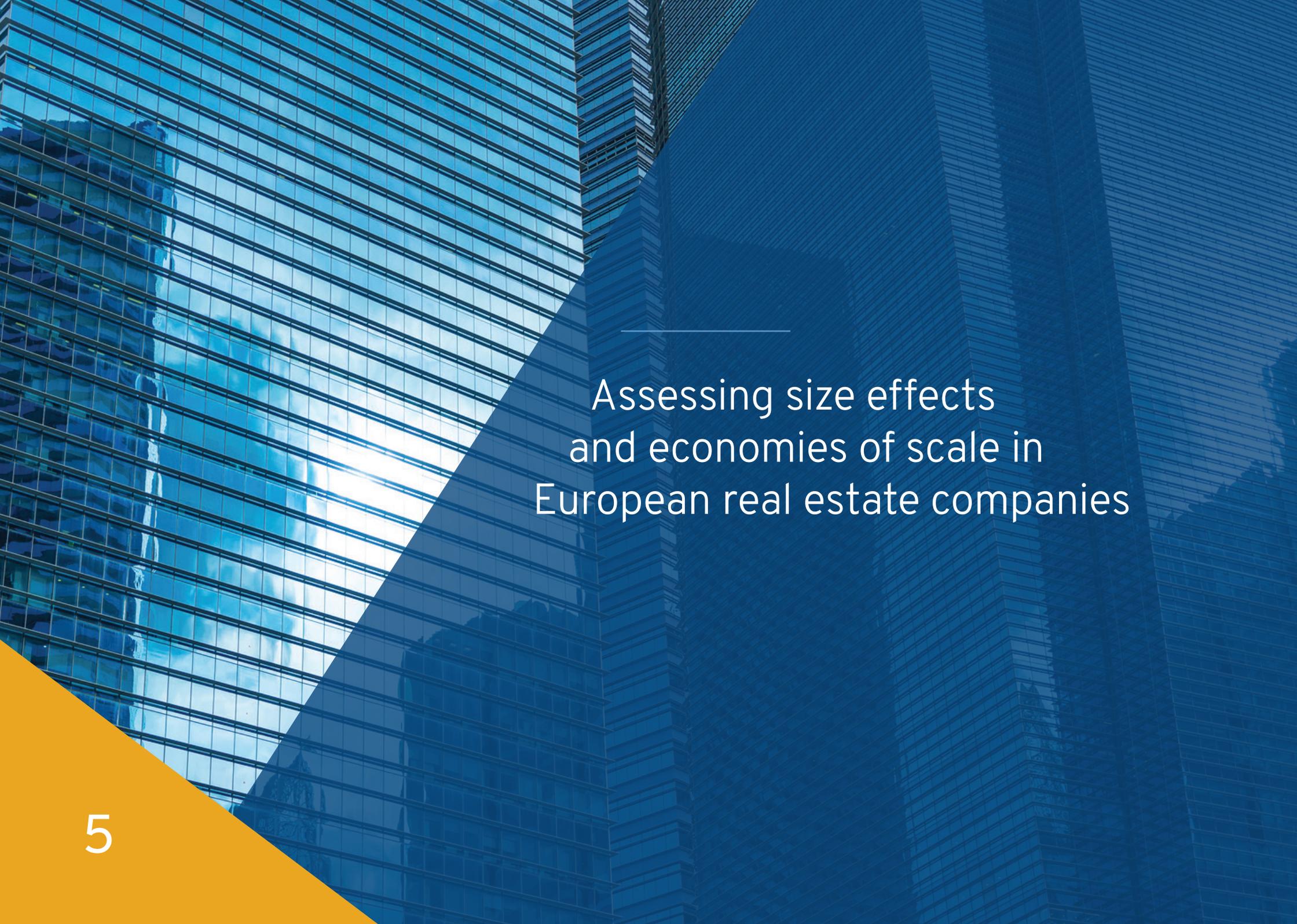
Executive summary

In this paper, we provide empirical evidence on the link between public real estate returns and interest rate dynamics for 723 listed real estate investment companies in 10 countries for the period 1999-2015. Our results show that the interest rate sensitivity of public real estate companies increases when credit is tight and more expensive but the sensitivity differs widely across individual firm. Knowledge of the interest rate sensitivity of individual listed real estate firms allows investors to increase or lower their interest rate exposure in their asset mix. We find that this interest rate exposure is rewarded with higher returns, as the spread between highest and lowest interest rate risk group within the listed real estate market equals 3.47% a year. This shows that interest rate sensitivity not only varies across firms, but also leads to variations in subsequent returns. Finally, we also examine the characteristics of public real estate firms that help to explain the observed variation in firm-level interest rate beta's. Our empirical results confirm what the available literature indicated before. We find that interest rate sensitivity is stronger for firms with large fractions of short debt maturities and low occupancy rates in their property portfolios. Results that are in line with the cash flow concept of duration, since shorter term debt enhance the exposure of a firm to the swings of interest rates.

The implication of these results is relevant for a wide audience. For public real estate firms our results indicate that capital structure management gains relevance, since subsequent stock returns are related to firm leverage. For investors, our results show that it is important and relevant to include the details of interest rate sensitivity into their due diligence process, as a premium can be earned and lost due to the ex-post exposure to interest-rate risks. Finally, our

results also have implication for the academic literature as we provide evidence that research on interest rate risk for non-fixed income investments is needed. Also beyond the concept of duration, new metrics may well be needed to capture and examine why interest rate risk differs across firms and over time. More research is needed to disentangle this interest rate impact on stock returns and to design metrics that succeed in capturing price relevant interest rate risk ex-ante. ■

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Assessing size effects
and economies of scale in
European real estate companies

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June 2017



Category: Asset insight & Performance

Keywords: scale, cost of capital, revenue, expenses, size, profitability, efficiency

Leading research institution:

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5 Assessing size effects and economies of scale in European real estate companies

Executive summary

This research investigates scale economies in listed European real estate companies. As such it is likely to be most of interest to those managing listed real estate companies and those investing in listed real estate companies but the issues raised in the paper are also likely to be of interest to those operating in private real estate markets.

The expectation is that costs should fall as firms grow as they can share fixed costs over more assets and have access to more sources of capital lowering the cost of capital. The study examines 236 European (both in listing and where investing) real estate companies over the period 2001 to 2015. The research examines size effects on revenue, expense, profitability and capital costs and finds that larger real estate companies are more profitable as a result of being able to operate with lower costs. Our finding of economies of scale is robust to the choice of analytical approach used in measurement. Both methods of analysis suggest that the marginal effect of increasing scale is greater for smaller firms than larger firms – for small firms getting bigger makes a substantial difference to costs and profitability whilst the impact of getting bigger on a larger firm is more modest. Pre- and post- merger analysis shows no evidence of synergies or efficiencies feeding through to lower costs or higher returns. Merged firms have significantly lower returns and higher costs of debt relative to industry averages compared with the pre-merger period. Thus, it appears that costs and loss of focus (increased diversification) from buying other companies typically outweigh the potential benefits. ■

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Decomposing the value
effects of sustainable
investment

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Category: Sustainability & Performance

Keywords: sustainability, performance, rental values, operating expenses, systematic risk, reporting

6 Decomposing the value effects of sustainable investment

Executive summary

Survey evidence suggests that the primary concern of REIT managers in relation to sustainability efforts is the impact on financial outcomes of the firm. So, do environmentally sustainable properties offer benefits for the financial performance of the firms investing in them? If so, what are the underlying economic mechanisms driving these performance effects? In this study, we systematically decompose the effects of sustainability practices on the value and performance of listed real estate investment firms in the US and the UK. In the US, we find evidence of higher rental values for firms with a larger share of sustainable properties in their portfolio. We also find that they incur higher operating expenses, as sustainable properties tend to be high-tech, smart buildings.

On the corporate level, we find evidence of lower interest expenses associated with investment in more sustainable properties. Bottom line: We find that sustainable investment increases funds available for distribution to shareholders. In terms of valuation outcomes, we find that US REITs with a larger share of sustainable properties in their portfolio additionally benefit from lower systematic risk and higher market valuations relative to their net asset value. In the UK,

where a baseline level of environmental reporting is mandatory, we find that listed property companies benefit somewhat from investments in sustainability-certified properties through higher earnings and improved valuation outcomes. However, the results are less nuanced than in the US. The compulsory environmental disclosure for investment property in the UK may reveal environmental underperformance and thus gradually improve the average level of environmental sustainability of the local building stock, attenuating the effect from any additional voluntary sustainability labels in this country-market. ■

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The impact of financial market
regulatory announcements
on the European listed
real estate sector

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April 2016



Category: Performance

Keywords: regulation, Basel III, AIFMD, EMIR, performance

7 The impact of financial market regulatory announcements on the European listed real estate sector

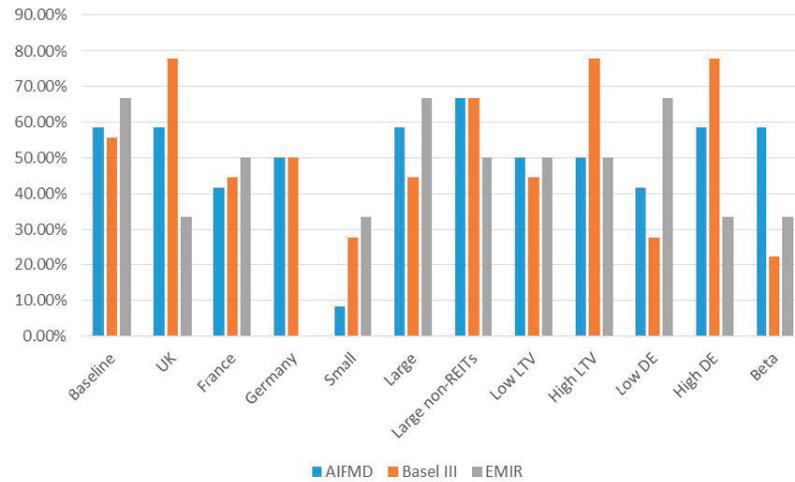
Executive summary

This study investigates the impact of international financial regulation on listed real estate companies. In particular, we look at how three regulatory reforms undertaken in the aftermath of the global financial crisis have affected returns and credit default swap (CDS) spreads of real estate companies. The three reforms are aimed at regulating different segments of the market – Basel III targets banks, and could restrict the availability of bank debt to the sector, the Alternative Investment Fund Management Directive (AIFMD) targets funds, which could increase compliance costs and reduce the potential investor pool, while the European Market Infrastructure Regulation (EMIR) is aimed at derivative trading and could impact the cost of debt capital.

We employ an event study methodology using daily financial market data and identify the regulatory events through news in the media. A regulatory reform is associated with several dates as the regulatory proposals are subject to changes prior to the enactment. What counts as the dates of the reform, are news articles appearing in major international financial newspapers and news agencies which announce the introduction of a new regulation and amendments to it (either tightening or loosening).

Our results are summarised in Figure A below. On average, market participants trading real estate equities and CDSs respond significantly to regulatory announcements; however, we observe differences across countries, types of companies (large versus small, more leveraged versus less leveraged) and the regulations themselves. The strongest effects for real estate equities are associated with Basel III and AIFMD. The effects on the credit performance are much larger in scale but only

Figure A: Share of significant responses of European listed property companies following news announcements about Basel III, AIFMD and EMIR



a few are ignificant. The most significant effects following regulatory news are observed for British companies, large European companies and highly leveraged European companies. This is in line with what we would expect. Larger companies are more likely to be affected as they have greater stock liquidity which provides a mechanism for an immediate stock market response to news regarding financial regulation. Higher leveraged companies are more responsive to changes in regulations targeting primary the debt funding sources for listed real estate companies. However, we do not see that the abnormal returns are associated with increased credit risks as CDS spreads do not respond significantly to most news. We observe that companies respond significantly to regulatory announcements mainly associated with negative news rather than positive news which can be seen as evidence for asymmetrical return response to shocks. Overall, albeit not directly regulated, the listed real estate market is affected by ews about financial regulatory reforms with the majority of the returns significantly decreasing following the announcements. ■

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The liquidity of international
real estate securities

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November 2016



Category: Performance

Keywords: liquidity, inflation hedging, market maturity, REIT regime

8 The liquidity of international real estate securities

Abstract

This paper examines the liquidity of international real estate securities, across three continents over the period 1995-2015.

We apply and compare results for four different measures of liquidity, and find that liquidity has increased consistently, wide variations across markets exist. All four measures – volume, turnover, Amihud's illiquidity ratio, and the number of zero return days – all identify the U.S., Japanese and Australian markets as the most liquid ones in the world. The introduction of a local REIT regime does not to have any pervasive effects on stock liquidity, as European REIT markets like Germany and France still lag behind.

When we link these liquidity statistics to the corresponding returns, we document new and consistent evidence for international trend chasing behavior in listed real estate market. Liquidity is commonly a function of past returns. At the same time, we also find interesting international variations in our output that suggests that the interaction with the equity market is dependent on the dominance of the local financial market.

In case financial markets are strong, we find strong interaction between equity returns and listed real estate liquidity and returns. We also report evidence that the auto-regressive patterns in both liquidity and returns of real estate securities weaken when markets mature and become more efficient.

Finally, we find that in these most mature markets, listed real estate effectively serves as an inflation hedging store for value when the economy weakens. ■

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Blending spezialfonds and
global listed real estate

The authors



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September 2015



Category: Allocation

Keywords: unlisted funds, listed real estate, composition, performance, volatility

9 Blending spezialfonds and global listed real estate

The blended approach to real estate allocations: Performance implications of combining an exposure to German Spezialfonds with global listed real estate securities

Executive Summary

This paper seeks to increase the understanding of the performance implications for investors who choose to combine an unlisted real estate portfolio (in this case German Spezialfonds) with a (global) listed real estate element. We call this a “blended” approach to real estate allocations. For the avoidance of doubt, in this paper we are dealing purely with real estate equity (listed and unlisted) allocations, and do not incorporate real estate debt (listed or unlisted) or direct property into the process.

A previous paper (Moss and Farrelly 2014) showed the benefits of the blended approach as it applied to UK Defined Contribution Pension Schemes. The catalyst for this paper has been the recent attention focused on German pension fund allocations, which have a relatively low (real estate) equity content, and a high bond content. We have used the MSCI Spezialfonds Index as a proxy for domestic German institutional real estate allocations, and the EPRA Global Developed Index as a proxy for a global listed real estate allocation. We also examine whether a rules-based trading strategy, in this case Trend Following, can improve the risk adjusted returns above those of a simple buy and hold strategy for our sample period 2004-2015.

Our findings are that by blending a 30% global listed portfolio with a 70% allocation (as opposed to a typical 100% weighting) to Spezialfonds, the real estate allocation returns increase from 2.88% p.a. to 5.42% p.a. Volatility increases, but only to 6.53%, but there is a

noticeable impact on maximum drawdown which increases to 19.4%. By using a Trend Following strategy, raw returns are improved from 2.88% to 6.94% p.a., The Sharpe Ratio increases from 1.05 to 1.49 and the Maximum Drawdown ratio is now only 1.83% compared to 19.4% using a buy and hold strategy. Finally, adding this (9%) real estate allocation to a mixed-asset portfolio allocation typical for German pension funds there is an improvement in both the raw return (from 7.66% to 8.28%) and the Sharpe Ratio (from 0.91 to 0.98). ■

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The relationship of REITs
with direct real estate and the
stock market in the presence of
speculative price bubbles

The authors



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The authors have carried out extensive research work on risk metrics in real estate. They pursue the development of new risk concepts and assess the implications for portfolio management internationally.



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May 2015



Category: Correlation

Keywords: speculative bubbles, risks, correlation, countries

10 The relationship of REITs with direct real estate and the stock market in the presence of speculative price bubbles

Executive summary

- The present study focuses on the detection of speculative price bubbles in listed real estate and REITs, direct property and general stock markets.
- The term ‘bubbles’ in this paper refers to periodically collapsing speculative bubbles.
- Price rallies with prices moving away from fundamentals do not necessarily constitute speculative price bubbles. Periodically collapsing speculative bubbles are consistent with the assumption of rational expectations and are likely to lead to market crashes.
- Detecting the presence of price speculative bubbles or rejecting their existence is attempted by direct bubble tests designed to establish this particular type of bubbles.
- The term REIT in this report is also used to include listed real estate in the geographies where strict REIT type structures do not exist.
- At times when speculative bubbles have occurred, the likelihood of price collapsing is high leading to significant impact on portfolio valuations. Hence, the study focuses on situations of severe downside risks originating in the presence of speculative bubbles presenting investors with an additional risk measure to conventional metrics.
- Evidence of speculative bubbles in listed real estate prices is found in four European countries, France, Germany, Belgium and Sweden but not in the UK.

- Bubbles transmit and contaminate other asset classes. We therefore examine the transmission of bubbles from the direct property and stock markets to listed real estate markets.
- Our results do not establish a general and common pattern in the spillover of bubbles. The listed real estate market offers protection from the direct market in France and Belgium but not in the UK, Sweden and Germany.
- The listed real estate market offers protection from bubbles in the general stock market in Germany and Sweden, making the case for more securitised real estate in pure equity portfolios in these countries.
- The analysis of speculative price bubbles can be used for price discovery in the REIT market and as an early warning for possible shocks to portfolio valuation from a market crash.
- A trading strategy based on the bubble collapse and spillover methodology outperforms the naïve strategy in four out of the sample of five countries. ■

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Are REITs real estate or stocks?
Dissecting REIT returns in
an asset pricing model

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January 2015



Category: Performance, Asset insight

Keywords: risk premia, multi-asset portfolio, listed real estate, direct real estate

11 Are REITs real estate or stocks?

Dissecting REIT returns in an asset pricing model

Executive summary

The key finding

We propose a structural asset pricing model to decompose the return premia of listed real estate, direct real estate and common stocks. We find that a model specification with stock market spillovers from common stocks to listed real estate comes closest to the observed empirical data and induces a correlation between common stocks and listed real estate which is twice as large as that between common stocks and direct real estate. Despite this substantial stock market spillover, the correlation between listed and direct real estate remains high and illustrates the surrogate potential of listed real estate vehicles for the direct real estate market. According to our calibration, the expected listed real estate premium consists of 36% stock market risk, 40% real estate risk and 24% business cycle risk.

The question and motivation

Investors who are interested in obtaining real estate exposure in their stock- and bond-dominated portfolios often try to achieve this by investing in publicly traded REITs. But it is questionable as to which extent they really invest in the underlying real estate market by using this vehicle. In other words: Are REITs real estate or stocks? Academics as well as practitioners are surprisingly divided in their opinion as to the fundamental driving factors behind the returns and risks of listed real estate investments. Investors need a deeper understanding of the basic link between the different markets and influencing risk factors in order to know whether they are investing in real estate risk or stock market risk when buying REIT shares. With our asset pricing model, we quantitatively show to which extent REIT returns can be explained by a

combination of the pure stock market risk, pure real estate market risk and business cycle risk. This result helps investors to reallocate their multi-asset portfolios to their actual desired exposure to the different risk factors.

Our data

There is surprisingly little work that tries to connect these findings in a theoretically rooted asset pricing framework. This is why we introduce a structural asset pricing model which allows us to study the linkages between common stocks, listed real estate and direct real estate in an innovative way. To calibrate our theoretical asset pricing model, we use the data of price and income returns for all three series: (1) stocks, (2) listed and (3) direct real estate in the US between 1984 and 2011. To describe the properties of the stock market, we rely on the Russell 3000 Index. By using such a broad market index, we consider possible growth or market capitalisation effects in stock returns. Data for the direct real estate market are gathered from the NCREIF NTBI Total Return Index. This index is best qualified to be consistent with the investment universe of the listed real estate market. For the listed real estate market, we use data from the FTSE NAREIT Equity REIT Index.

Our model

With a principal component analysis we can show that there are three major different sources of priced risk in both real estate assets and common stocks: (1) business cycle risk (or market-wide risk), (2) stock market specific risk and (3) real estate market specific risk. The return dynamics of all three asset classes are explained by combinations of these three risk factors. By means of our model, we quantitatively account for the stochastic properties of the three assets and we are able to investigate economic linkages between the stock market and the real estate market. Our asset pricing model allows us to solve for the return generating process of all three assets and to compare the stochastic properties of simulated data with those of empirical data. For a better understanding of the potential linkages between the stock market and the real estate market, we apply two different

model specifications, so that we can control for the potential influence from the stock market on the listed real estate market. The first model specification allows for stock market spillovers to listed real estate whereas the second model specification does not include such spillovers.

Our results

First, we calibrate the model to match the empirical data of common stocks, listed real estate and direct real estate. We find that the model with stock market spillovers is closer to observed empirical characteristics of listed real estate than the model without spillovers is. In more detail, the former matches the empirical average returns of all three assets very well, and the standard deviations and first-order autocorrelation reasonably well. The correlation between common stocks and listed real estate is similar to the empirical data. However, the correlation between stocks and direct real estate is lower, and the correlation between listed and direct real estate is larger than in the empirical data.

Second, we analyse the dissection of the expected risk premia of all three asset classes. In the model specification with spillovers, the expected listed real estate premium can be dissected into 36% stock market risk, 40% real estate risk and 24% business cycle risk. Simply put, stock market spillovers cause about one third of the listed real estate premium and consequently induce a correlation between common stocks and listed real estate which is twice as high as that for direct real estate. Despite this substantial stock market spillover, the correlation between listed and direct real estate remains high in the model and illustrates the surrogate potential of listed real estate vehicles for the direct real estate market.

Conclusion

With our straightforward and intuitive asset pricing model, we can mimic several important empirical properties of common stocks, listed real estate and direct real estate. A specification which includes

a medium-sized spillover channel from common stocks to listed real estate shows that the expected listed real estate risk premium can be dissected into 36% stock market risk, 40% real estate risk and 24% business cycle risk. Using these quantitative results, our model can help to allocate multi-asset portfolios with publicly traded REITs in order to replicate the exact exposure of the underlying direct real estate market.

Abstract

Based on an innovative approach, we investigate the potential linkages between common stocks, listed real estate, and direct real estate. A principal component analysis shows that three factors are required to jointly explain the empirical risk premia of the stock market and the two real estate markets: market-wide risk (or business cycle risk), stock market specific risk, and real estate market specific risk. Our model calibration can closely replicate the patterns in the data and allows us to dissect the respective risk premia of the three assets. A medium-sized spillover channel from common stocks to listed real estate – which is not present in direct real estate – is plausible with the data. ■

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The sensitivity of European
publicly-listed real estate
to interest rates

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January 2015



Category: Performance, Inflation hedge, Correlation

Keywords: legal structure, gearing, sensitivity, time-variation

12 The sensitivity of European publically-listed real estate to interest rates

Executive summary

This report examines the exposure of European public real estate markets to interest rates, a topic of evident importance given the events of the last decade. While events in the credit markets played a pivotal role in the 2007-09 financial crisis, the broader relevance of monetary policy and interest rates was clearly seen both in the preceding boom and in the resulting financial and economic crisis. This report contributes to the existing literature in a number of respects. Firstly, it considers the sensitivity at both a market/sector and firm level. Secondly, in both cases we expand upon the methodological analysis commonly adopted. Finally, with the exception of the UK, very little research has been conducted on this topic in the context of European markets.

Using a sample period from 1996-2013 we consider a total of seven countries at a market level, a coverage that is expanded to 15 when individual firms are examined. The first stage of the analysis considers the market level exposure of European public real estate using an empirical specification that allows consideration of both sensitivity in returns and risk. The analysis considers both short and long-term interest rates as well as a measure of the term spread. The results highlight the overall sensitivity of the listed property sector to interest rates.

With the exception of Belgium, in the case of volatility, and Switzerland, for both returns and volatility, significant results are reported in every case. However, in common with the broader literature there is evidence of time-variation in the results and diverging sensitivity depending on the interest rate proxy modelled. In the baseline specifications it is interesting that the temporal instability does not necessarily point to

heightened sensitivity in more recent past. The empirical analysis of the index data is then extended to consider a broader analysis of the entire term structure. The additional specifications that consider the full-range of the yield curve and regime switches find broadly similar results. However, the regime-switching results do show that interest rate risk is predominately significant during the periods of instability (bear states).

The firm-level analysis reveals a number of interesting findings. We find evidence that firm characteristics, and especially gearing levels, have a significant impact on the degree of exposure observed. Compared to previous studies the results do reveal more significant findings. As with the market level analysis we further observe time-variation in the results. However, in this case the impact of the financial crisis is more distinct. We find that in a number of cases, e.g. asset-structure and book-to-market, the results are more evident since the financial crisis.

The results also highlight the importance of considering the legal structure in place. This is especially important given that in most of the countries examined REITs were introduced during the sample period. Despite the fact that REITs were more prominent in the second half of the sample around the financial crisis, we still observe that REITs display reduced exposure than property companies.

A number of broader implications for investors are apparent from the results. Firstly, at both a market and firm level we analyse the sensitivity of returns as well as volatility. The results vary in many cases, highlighting the need to consider both components when analysing the impact of interest rates. Secondly, the temporal instability in the findings reinforces the importance of considering prevailing market conditions. ■

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Capital structure and
firm performance

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Category: Performance

Keywords: leverage, debt maturity, fixed-rate debt, refinancing, firm value

13 Capital structure and firm performance

Executive summary

Capital structure theoretically matters for firm value as soon as the assumption of frictionless capital markets underlying the traditional Modigliani and Miller (1958, 1963) irrelevance proposition is violated. Research allocates considerable resources to identifying firm characteristics that reflect real-world market frictions, such as asymmetric information or agency costs, and may thus drive capital structure choices. Insight into the relationships between firm characteristics and the corresponding optimal capital structure is valuable for managers and investors if capital structure empirically has a significant impact upon firm value.

The characteristics of REITs as regulated, tax-exempt, going concerns that operate portfolios of large, long-lived assets with significant debt capacity and distribute the majority of income as dividends, have a number of implications for the optimal capital structure that helps improve firm value. The optimal capital structure of a firm is a complex package of claims that encompasses multiple dimensions. Especially in real estate, debt may be secured against specific assets, or unsecured. More generally, interest rates may be fixed or floating, or firms may issue convertible debt instead of conventional debt. Empirical research is typically limited to a small number of capital structure dimensions, such as leverage or debt maturity, which are commonly studied in isolation. In reality, each of the multiple dimensions of capital structure may influence firm value individually, and there may be significant interactions. Our first objective is to identify those combinations of capital structure characteristics that are empirically related to superior firm quality.

Real estate, because of its fixed location that depends on the surrounding economic, financial and regulatory conditions, is local in nature. Therefore, the financing of real estate investments is intricately linked to local credit market conditions and the local institutional environment. International disparities in legal and tax systems as

well as the culture of different financial systems may have significant implications for the empirical links between the composition of capital structure and firm value across countries. However, international capital structure research often focuses on industrial firms, excluding real estate, and so far produces mixed results on the significance of institutional factors. Existing research thus offers limited practical guidance for the optimal capital management of international real estate firms. Our second objective is to contrast and compare the empirical links between capital structure and firm quality across the US and a sample of European markets.

In the wake of the global financial crisis, research into the relationships between the composition of corporate capital structure, financial flexibility, liquidity and financial constraints and the links to firm value has attracted significant attention. Our third objective is therefore to examine a selection of sub-periods before and after the onset of the recent global financial crisis to explore how the links between the composition of capital structure and firm value vary through different regimes in the real estate and capital market cycle.

In our empirical analysis, we study a sample of international listed real estate investment firms from the US (1993-2013) and a selection of European countries, including France, Germany, the UK, and the Netherlands (2001-2013). We include all firms reported on the SNL Financial database that are classified as equity REITs in the sample countries.

We first employ unconditional multivariate analysis to identify those combinations of capital structure characteristics that are associated with a stronger firm quality. We find that stronger firms tend to employ less leverage, longer debt maturity, maintain larger proportions of fixed-rate debt, rely less on secured debt, have more line of credit capacity but use it less, and hold smaller cash reserves. These results for the full sample are closely aligned with those for the US firms.

An analysis by geography suggests that the European firms are more homogeneous than those in the US. The earlier leverage result extends

to the European sample too. However, the inverse relationship between leverage and firm quality is the only significant result in the European sample. Therefore, our results suggest that a firm characteristic-informed optimal capital structure is less directly related to firm value in Europe than it appears to be in the US. This interpretation implies that institutional factors in Europe, potentially driving variation in the relative cost of different forms of capital, may outweigh the impact of firm characteristic-related capital structure choices on firm value.

We subsequently explore the marginal impact of changes in individual dimensions of capital structure on firm value in the full sample, conditioning on existing firm and capital structure characteristics. Our results largely support our findings from the unconditional multivariate analysis but additionally suggest significant interactions between individual dimensions of capital structure. For example, on an unconditional basis, both secured debt and leverage are individually associated with lower firm quality. The conditional analysis reveals an inverse relationship between leverage and firm quality but a positive relationship between secured debt and firm quality in the US. Our finding suggests that highly levered firms, whose capital structure exposes them to increased bankruptcy risk, may be able to mitigate the effects of leverage on firm quality by pledging collateral when sourcing debt capital. Conditional on high leverage, stronger firms with a sound asset base may be in a better position to do so.

The analysis of the marginal effects of capital structure choices on firm value in Europe allows us to identify a number of differences across the institutional environments that prevail in our set of European sample countries. Overall, our results resonate the findings from the unconditional multivariate analysis. Most poignantly however, high leverage has the strongest negative effect on firm value in Germany, followed by more moderate effects in France, the Netherlands and the UK. This finding suggests that the international capital markets react differently to variation in leverage levels, depending on the underlying institutional setting.

The longer history of detailed capital structure data available for the US firms allows us to measure variation in the sensitivity of firm value to capital structure choices across different real estate and capital market regimes inside and outside of the recent global financial crisis. Overall, we find that the marginal effects of capital structure choices on firm value are robust to variation in these capital market regimes. The exception is the relationship between revolving credit facilities and firm quality, which is significantly positive, but only during the crisis period. Our finding supports the view that, consistent with the unconditional multivariate analysis in the full sample, stronger firms have more line of credit capacity. During the crisis however, these firms have also been able to rely more heavily on previously granted lines of credit as a source of liquidity, whereas weaker firms faced substantial refinancing risk and lenders were also perhaps less willing to allow these weaker firms to draw down their lines of credit.

Our results have significant practical implications for managers and investors of international listed real estate firms. First, our findings assist managers in optimising multiple dimensions of capital structure choices to improve firm value, depending on the characteristics of the firm, the institutional environment and the prevailing capital market regime. Second, our findings provide guidance for investors in international real estate firms in drawing inferences about firm quality from the composition of corporate capital structure in different countries and at different points in the cycle. Overall, our conclusions offer substantial benefits for financial decision-makers by promoting well-informed capital structure and investment choices.

We proceed as follows. Section “Background” presents a brief review of the literature and assists us in forming expectations about the relationships between REIT characteristics and the optimal composition of capital structure. Section “Data and method” outlines sample structure and variable definitions, presents descriptive statistics and summarises our empirical approach. Section “Results”

discusses our empirical findings. The final section concludes premised on the lower informational sensitivity of convertible debt relative to straight equity, resulting in relatively lower adverse selection costs. This explanation is particularly relevant for firms with high levels of asymmetric information about the quality and riskiness of their underlying assets or if investors are concerned about ex-post risk shifting (Green, 1984; Brennan and Kraus, 1987; Brennan and Schwartz, 1988). In these situations, convertible debt may help resolve agency conflicts based on asymmetric information, resulting in a more subdued drop in share prices than that likely to occur following a straight equity issuance (Constantinides and Grundy, 1989; Stein, 1992). On this basis, we expect that lower quality firms may rely more heavily on convertible debt.

Sinai and Gyourko (1999) examine the effect of the UPREIT structure on firm value. The UPREIT structure permits the issuance of tax-exempt operating partnership units in exchange for properties. This structure stands in contrast to regular REITs that must pay for properties with cash or stock, giving rise to a capital gains tax liability for the seller. Under the UPREIT regime, capital gains tax is deferred until the seller converts their operating partnership units into shares or the REIT sells the corresponding properties. The deferral of the capital gains tax liability can represent a sizeable advantage for the seller, potentially enabling UPREITs to purchase properties at lower prices compared to regular REITs. Furthermore, the existence of UPREIT shares may improve management commitment, as the tax penalty of selling these shares gives managers an incentive to continue to hold, raising their equity stake in the firm and thus aligning their interests with those of regular outside shareholders. On the other hand, the same tax penalty may also incentivise managers not to sell UPREIT properties when current market pricing suggests that it is economically sensible to do so. On balance however, we expect a positive relationship between UPREIT equity and firm value. ■

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Leverage and returns:
A cross-country analysis of
public real estate markets

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February 2014



Category: Performance, Allocation

Keywords: levered returns, financing constraints, return amplification

14 Leverage and returns: A cross-country analysis of public real estate markets

Executive summary

Numerous studies have examined the impact of both fundamental and behavioral factors on the levered returns of publicly-traded real estate companies. However, the role of financial leverage in real estate returns has received relatively little attention. The recent financial crisis, during which credit markets froze and the equity returns of public real estate companies sharply declined, provides further motivation to understand the potential effects of leverage on risk and return. In this paper, we examine the effects of financial leverage on firm-level returns and volatility in the following eight countries: Australia, Belgium, Canada, France, Japan, the Netherlands, Singapore, and the US.

Our initial sample of publicly-traded real estate companies is obtained from EPRA. This 2002-2011 sample includes firms able to avoid taxation at the entity level, which we refer to as REITs, as well as non-REIT operating companies, such as large homebuilders, brokerage firms, and management companies. We then merge our EPRA sample with stock market and accounting data from DataStream necessary to unlever returns at the firm level. We construct a monthly time-series of levered and unlevered total returns for each company in the sample and value-weight these returns into unlevered return indices for each of the eight countries and for our aggregate “All-Countries” sample. We also create separate levered and unlevered return indices for REITs and non-REITs in each country and in the aggregate.

After providing a discussion of the risk-return characteristics of REITs and non-REITs in each country, we employ panel regression techniques to examine the conditional relation between firm leverage and total REIT returns both within and across countries. We pay particular attention to the effects of the 2007-2008 REIT crisis period on returns

and to the extent to which leverage magnified return effects during this crisis period. We also examine the extent to which the inclusion of proxies for variation in firm-level financing constraints (distress) helps to explain the cross-section of firm-level returns.

We find that levered public market real estate returns are significantly higher and more volatile than unlevered returns over the 2002-2011 sample period, suggesting a positive unconditional relation between leverage and returns for public real estate firms. The results from our panel regressions also provide strong empirical support for the hypothesis that leverage amplifies REIT returns in both a positive and negative direction. We also find that greater use of leverage during the 2007-2008 REIT crisis period is associated with larger REIT share price declines, all else equal. Finally, we find limited support for the hypothesis that the firm-level financing constraints help to explain the observed variation in levered REIT returns during our sample period. ■

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Corporate real estate
acceptance

The authors



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Category: Performance, Asset insight

Keywords: IFRS lease accounting, survey, real estate management

15 Corporate real estate acceptance

Executive Summary

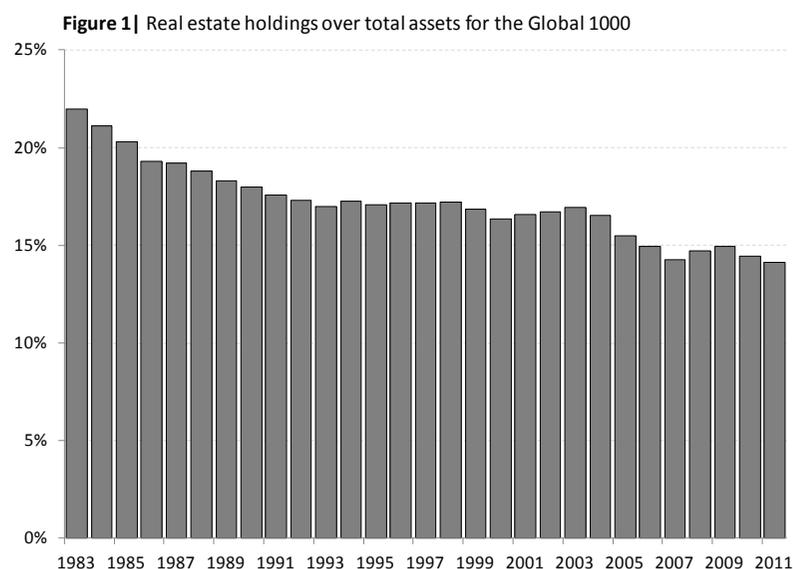
While often taken for granted, corporate real estate holdings are sculpting the financial DNA of non-real estate firms around the globe. Ever since *Zeckhauser and Silverman (1983)* called upon corporate management to rediscover their company's real estate, a large literature has evolved around the strategic importance of these corporate assets. But in this era of liquidity constraints and at the dawn of IFRS Lease Accounting transparency, it is time to also focus on the financial effects of corporate real estate decisions. In this article, we present an overview of the corporate real estate stakes and trends, and look ahead to the REIT opportunities they entail.

Five stages of corporate real estate management

In the early years, corporate real estate holdings were merely a necessity for firms to operate. In the absence of a well-developed commercial rental market, there was little alternative to developing or buying your local offices and shops. Hence, corporate growth would automatically result in the build-up of a portfolio of land and structures, which easily accumulated into significant proportions of the balance sheet. But how to manage these corporate real estate portfolios has long been a consideration that was simply not contemplated.

In fact, the views on corporate real estate management, both from professionals and within academia, have evolved only gradually over time. This evolution of prevailing views on how to deal with corporate real estate needs exhibits strong resemblance with the *Kübler-Ross (1969)* model, which describes in five discrete stages a process by which people deal with personal grief: I. denial, II. anger, III. bargaining, IV. depression, and V. acceptance.

Although the literature on corporate real estate management has come a long way during the past 30 years, not all firms have actually reached the final phase of acceptance. Surely, a lot has changed from the time when the call for rediscovery by *ZeckHauser and Silverman in 1983*. Most firms have employed specialised corporate real estate managers, and have positioned corporate real estate departments that often report directly to the board. There is no more ‘denial’ in corporate boardrooms when it comes to their real estate needs.



Also the stakes have changed. Figure 1 reports the corporate real estate ratios – the book value of real estate assets over total assets – for the international constituents of the Dow Jones Global 1000 since 1983. While real estate assets accounted for over 22% of total assets in 1983, today 30 years later this number has gradually dropped to 14%.

This trend can be explained by multiple factors. First of all, we have seen a wave of Sales-and-Lease Back (SLB) transactions that has

helped firms to move some of their real estate assets away from their corporate balance sheet. There are multiple operational reasons for why firms prefer to rent rather than to own their real estate properties. For instance, because to avail themselves of in-house professional property management. From a financial point-of-view, in theory, SLB do not affect the value of the firm, as SLBs merely swap a sale price for a corresponding set of future lease payments. Switching from ownership to leasing does not reduce the importance of corporate real estate within the firm, it merely reduces the current weight on balance sheets. In many cases this ratio has also dropped because the rate at which the total asset base increased has outpaced the real estate price trend.

In any case, 14% is still a significant number and judging by the wording in Annual Reports, we cannot claim that enough is communicated by firm management about this portion of firm value to claim the status of “acceptance” stage V. In fact, using a simple symantec tool when analysing a set of 100 different 2012 Annual Reports, we encounter the word “realestate” 1.4 times on average, and mostly in technical footnotes at the end of the report. Which compares bleakly to the fact that “sustainability” was raised 7.2 times, on average. Counting words is hardly an adequate measure of acceptance or importance, but it does indicate that stakeholders learn little about corporate real estate management from reading these public reports. This, however, will soon change.

IFRS Lease Accounting, a game-changer

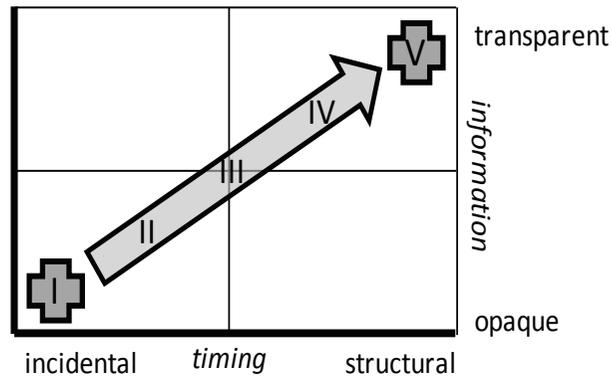
Ever since the International Accounting Standards Board (IASB) has started its work on promoting a more unified and transparent set of International Financial Reporting Standards (IFRS) the standard IAS17 for “Leases” has been widely debated. While in the past, leasing meant that the use of assets would only run as costs through the annual profit and loss accounts, firms around the world awake to a future in which leases will appear much more prominently on their corporate accounts.

As of 2014, the new IFRS lease accounting standard will eliminate off-balance sheet accounting; essentially all assets currently leased under

operating leases will be brought on balance sheet. The lease contract will be recognised both at the asset and liability side of the balance sheet and carried at amortized cost, based on the present value of payments to be made over the term of the lease. In other words, real estate use – both rented and owned – will appear explicitly in the books of firms.

This shift will greatly enhance the visibility of corporate real estate stakes and costs. Certainly, in the first few years this will have an impact on balance sheet ratios and thereby raise questions among shareholders. Questions that have not been asked for a long while and that require a board to be more fully aware of their corporate real estate position. This change in accounting standards will automatically shift the way in which firms communicate about their corporate real estate management. While in the past information on CREM was often opaque and incidental, we now enter an era in which the financial reporting will ensure that the numbers appear more often and more prominently.

Figure 2 | CREM Communication



In figure 2 we sketch a simple matrix of CREM communication. We consider information opaque when the numbers are scarce and appear only in technical notes, while information is transparent when

numbers are presented notably in combination with a clear discussion of CRE strategy and vision. Firms that are in the denial phase (I) tend to communicate only the bare necessities, as it is hard to talk about matters that one ignores. In case firms undertake SLBs or dispose of headquarters to free up capital, the numbers become more transparent as market values are typically involved here. But, these transactions are more incidental than structural.

One may even go as far as claiming that IFRS Lease Accounting will catapult firms automatically into the acceptance phase (V), especially when CREM communication is concerned. The information regarding a company’s real estate use and costs will become much more transparent and appear continuously in all reporting. These new numbers will raise new questions, first in the board room, then among analysts and eventually among stockholders. Questions like; do we really need to have all these assets on our balance sheet? How can we enhance the efficiency of our real estate operations? But to what extent are corporate managers ready to provide these answers? In what phase of real estate awareness are these big corporate today? How will this future wave of real estate awareness affect the REIT market? Thirty years after the *Harvard Business Review Survey* of Sally Zeckhauser, we seized the opportunity to ask the questions to real estate users around the world.

The CoreNet TiasNimbas Survey 2013

In February 2013, TiasNimbas Business School and CoreNet Global jointly surveyed over 3,000 CoreNet members on a variety of corporate real estate topics. This survey was designed after the 1983 *Harvard Real Estate Survey* by Zeckhauser and Silverman, which allows for comparisons over time and across continents. In total 291 (24 Asian, 45 European, 218 North-American) full responses have been collected, and here we report the main findings (the full report can be viewed at www.tiasnimbas.edu/CRE2013).

We address several issues, but start by examining the state of corporate real estate awareness. By posing simple questions on the knowledge and overview of their own real estate assets, we can assess in which phase firms are today. For instance, on the question: “how big is the stake of CRE as a percentage of your firm’s total assets?” 28% admits not to know this. A percentage that is higher among our European respondents (34%), and has decreased from 33% to 13% in the US since *Zeckhauser and Silverman* asked the same question in 1983.

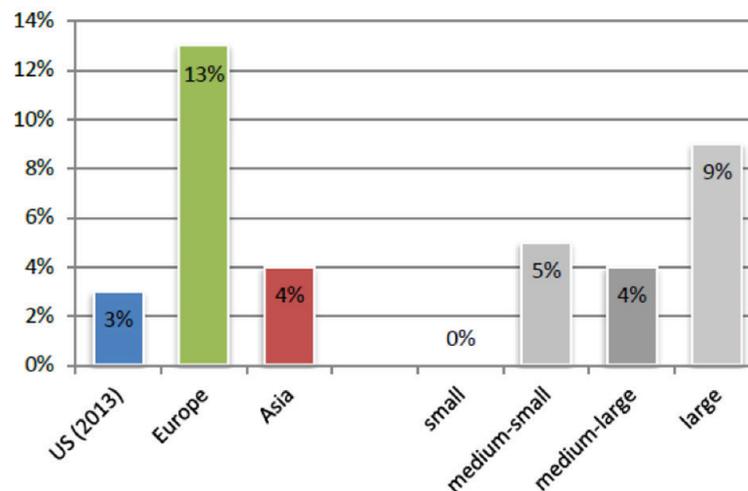
We also asked: “Do you have a full inventory of all your real estate assets?” 84% of our respondents confirmed that this was indeed the case. Again, compared to the 80% that *Zeckhauser and Silverman* reported in 1983 this awareness increased to 85% in the US and is weakest in Europe (73%). We also find that the largest firms (over 100,000 employees) have the best overview on the real estate assets. It seems that a large fraction of smaller firms has still not progressed into the fifth phase of real estate acceptance.

One of the key questions is how corporate real estate is managed and positioned within the firm. 79% of firms manage their real estate within a separate department (instead of a subsidiary) and in 73% of all cases they manage this as a cost centre (instead of a profit centre). Two numbers that have hardly changed since *Zeckhauser and Silverman (1983)*. Also new questions were asked. This way, we now learned that in 48% of these real estate groups report to the CFO, in the other cases we discovered a hierarchical link to ‘facilities’, ‘production and operations’, ‘marketing’, ‘HRM’ and often even ‘legal’. This line of command may well be relevant for the level of (financial) real estate overview and the forward looking behavior when it comes to real estate regulations.

We find that 18% of respondents claims to wait to prepare for IFRS until it’s implemented. A passive attitude that is most dominant among the smaller and European firms in our 2013 sample. But perhaps one of the most intriguing results for EPRA readers is the answers to the question: “does your firm consider carving out the real estate

portfolio as investment fund?” Over 13% of our European respondents confirmed that this was indeed the case. At earlier occasions in markets abroad, like Singapore in 2003, we have seen that a regulatory change has triggered a jump in REIT markets, as corporate started to offload their real estate assets. If we combine this 13% with the fact that 14% of corporate balance totals relates to real estate, and that the sum total of European corporate listed market caps currently hovers around EUR 10 trillion, we are looking at a potential of EUR 185 billion of real estate assets that is being considered.

Fraction that carves out the CRE portfolio as investment fund



Given that many firms are still not fully contemplating the full impact of IFRS, it is fair to say that this number might even be on the low end, and only relates to stock listed firms, whereas corporate real estate is as important for non-listed firms as well. Offloading these corporate real estate stakes may well be one of many routes that boards will consider, but a healthy and mature REIT market is both an important condition and a good home for when these waves start coming. ■

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Are public and private
real estate returns
and risks the same?

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16 Are public and private real estate returns and risks the same?

Conclusive summary

This article examines empirically the similarity of returns and risks for publicly traded securitised assets and privately owned non-securitized assets using real estate market data. The relationship between publicly and privately traded asset performance is of importance to a large number of investors and financial institutions due its portfolio and hedging implications. However, empirical examination of the question is usually not possible, since there are no reliable time series data on the typical underlying privately traded assets. Since reliable data are available both for securitized real estate (REIT) and direct real estate performance, the ‘duality’ of the real estate markets offers an opportunity to test the hypothesis of similar returns and risks regardless of the trading ‘platform’, i.e., regardless of whether the asset is traded in a public market place for securities or privately as a lumpy non-securitised asset.

The theory does not give a clear indication on whether the mean returns of publicly and privately traded assets should be the same. On one hand, it can be expected that the returns and risks of privately traded direct investments and of securities that are based on similar direct assets are alike, since the security cash flows are generated by the underlying direct assets. On the other hand, the returns on securities may notably deviate from those on private assets due to factors such as higher liquidity and smaller transaction costs of the securitized publicly traded assets, and due to varying diversification benefits offered by securities vs. direct assets.

We use sector level REIT and direct real estate total return indices for the US and UK to investigate the similarity of public and private market

returns and risks. The data, which cover the period 1994-2011 for the US and 1991-2011 for the UK, are adjusted to cater for the effects of leverage and management fees. We argue that cointegration analysis is more reliable than the conventional F-test in testing for the similarity of mean returns over the long horizon. Nevertheless, we report the F-test statistics in addition to the cointegration tests.

The results provide evidence of cointegration between the public and private markets in the four US sectors included in the analysis and in one of the two UK sectors. Thus, the analysis shows that while in the short run the observed REIT and direct real estate returns can substantially deviate from each other due to factors such as data complications, market frictions, and slow adjustment to changes in the fundamentals in the private market, in the long term public and private real estate returns are similar after catering for the effects of property type, leverage, and management costs. Moreover, in four of the five cointegrated sectors the hypothesis of a one-to-one relation between the adjusted total return indices can be clearly accepted.

We limit the test of risk equivalence to the standard deviation of total returns. The return volatilities generally do not differ significantly between REIT and direct real estate regardless of sector and time horizon. There may also be risks, such as liquidity risk, that differ between the markets and that are not catered for by the standard deviation of returns.

The findings are by and large robust with respect to the assumed private market management fees. While the cointegrating relations, including the one-to-one relations, are generally stable over time, notable deviations from these relations emerged during the GFC. These deviations appear to have been only temporary, although the US apartment and UK retail markets were still far from equilibrium in 2011Q4.

Our findings have important practical implications. First, the public and private real estate investments can be considered to work as good substitutes in an investment portfolio with several years investment horizon, since they provide similar total returns and return variances, and co-move tightly over the long horizon. As securitised real estate assets enable diversification with smaller amounts of capital, and the liquidity is better and transaction costs are lower in the public market than in the private market, our findings suggest that those investors who have relatively small amounts of capital and highly value liquidity and small transaction costs should tilt their real estate holdings towards publicly traded REITs. Nevertheless, this does not necessarily hold for all the real estate sectors, and liquidity and transaction costs tend to have less importance the longer is the planned investment horizon.

Second, the long-term similarity of public and private returns proposes that REIT related ETFs and derivatives can be used to hedge risks created by direct real estate holdings. As *Fabozzi, Shiller and Tunaru (2009)* note: “*A primary factor in deciding which derivative contract will provide the best hedge is the degree of correlation between the factors driving the price of the derivative instrument under consideration as the hedging vehicle and the underlying risk that investors seek to eliminate*”. Due to the one-to-one cointegrating relation between REITs and direct real estate, a possibility to take short positions on ETFs, for instance, offers a good opportunity to hedge risks in lending institutions’ portfolios that arise due to their outstanding mortgage lending inventory. Among other potential benefits¹, such hedging could help banks to survive better through the periods of economic distress and drastically decreasing real estate prices. From an investor’s point of view, in turn, during crisis periods the gains on the derivatives used to hedge the downside risks could be used as a source of necessary liquidity instead of having to conduct distressed sales of private assets with substantial discount.

¹ Englund, Hwang and Quigley (2002) point out that there could be large potential gains from instruments that would allow property holders to hedge their lumpy investments in housing.

Due to the potentially lengthy deviations from the equilibrium relations between public and private real estate, hedging cannot totally remove the risks. Moreover, in many markets the current public market related vehicles are not sufficient to properly exploit the hedging opportunities. That is, new financial vehicles, especially for taking long-term short positions, and more liquid markets for them are needed in order to be able to take better advantage of the hedging potentials.² Anyhow, the longer the horizon and the faster the adjustment of the private market towards the equilibrium relation, the better are the hedging opportunities. ■

² Fabozzi, Shiller and Tunaru (2009, 2010) provide a more detailed discussion on the potential use of real estate related derivatives.

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**The performance implications of
adding global listed real estate
to an unlisted real estate portfolio:
A case study for UK Defined
Contribution funds**

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January 2014



Category: Performance, Allocation

Keywords: return enhancement, currency impact, volatility, allocations

17 The performance implications of adding global listed real estate to an unlisted real estate portfolio: A case study for UK Defined Contribution funds

Executive Summary

This paper seeks to provide a better understanding of the performance implications for investors who choose to combine listed real estate with an unlisted real estate allocation. Specifically, it provides a detailed investor level analysis of the impact of combining UK unlisted fund and global listed real estate fund exposures to satisfy the requirements of a real estate allocation in a UK Defined Contribution Pension fund.

The catalyst for this paper was the recent report by the Pensions Institute: “Returning to the core: rediscovering a role for real estate in Defined Contribution pension schemes”. This highlighted both the rationale for real estate in DC funds, and specifically, the use of a blended product, which combined a 70% UK unlisted allocation with a 30% global listed allocation, to provide this exposure. We call this 70/30 mix a DC Real Estate Fund.

In addition there are currently three factors which are of utmost importance to investors, which lie behind the increased interest in blending listed and unlisted real estate:

- i) Liquidity
- ii) Cost
- iii) Ease of implementation

It is well understood that direct real estate can be a beneficial component of a multi-asset portfolio primarily due to the diversification benefits that it provides. However, one of the key challenges for both asset allocators and product developers is how to provide a direct or at least a direct-proxy real estate exposure in a mixed asset portfolio with acceptably high levels of liquidity and low levels of cost. This is a challenge for all private market asset classes. Clearly, a 100% exposure to unlisted funds or direct real estate would not be expected to meet this criteria.

Key Questions: In this paper we set out to answer the following questions:

- **Return enhancement:** What is the “raw” performance impact of adding listed real estate to an unlisted portfolio?
- **Risk adjusted impact:** What is the impact on portfolio Volatility and Sharpe Ratio?
- **Tracking error:** Does adding a global listed element significantly increase the tracking error of the portfolio relative to a UK direct property benchmark?
- **Currency impact:** Does adding a global listed portfolio introduce a material currency risk into portfolio returns?
- **Cash drag:** What is the impact on returns and volatility of adding cash to the portfolio?
- **Risk attribution:** What adjustments are necessary to understand the true relative contributions to portfolio risk?
- **Portfolio contribution:** Does this blended real estate product provide the diversification benefits of real estate in a multi-asset portfolio?

Differences from other studies

Firstly, we have taken actual fund data rather than index data i.e. we are analysing deliverable returns to investors. Similarly, by using fund data not only are we seeking to capture the impact of identifiable costs at all levels, but also provide a structure which has minimal implementation issues at a practical level. We rebalanced the portfolio quarterly so as to meet the target allocations (including a cash holding), and took account of resultant transaction costs.

Secondly, rather than use a single period, or peak to trough periods, we have broken down the study into an analysis during distinct stages of the cycle and over the full horizon (15 years).

Thirdly, our dataset comprises UK unlisted funds and global real estate securities funds, whereas previous studies have looked at the performance impact of combining listed and unlisted indices of the same country.

Finally, our study is seeking to provide greater understanding of the resultant impact of incorporating a real estate asset exposure for a specific investment requirement, namely the UK DC pension fund market.

Conclusions

- **Return enhancement:** Over the past 15 years a 30% listed real estate allocation has provided a total return enhancement of 19% (c. 1% p.a. annualised) to our unlisted real estate portfolios. Over the past 10 years this was 43% (c. 2% p.a. annualised), a result which is consistent with the previous Consilia Capital study. Over five year the enhancement is c. 4% p.a. annualised, amounting to +390% in absolute terms).
- **Risk adjusted impact:** The price of this enhanced performance and improved liquidity profile is, unsurprisingly, higher portfolio volatility, of around 2% p.a., from 6.4% to 8.4%. However, because of the improved returns, the impact on the Sharpe ratio is limited.

- **Tracking Error.** We found that there is an additional 4% tracking error cost vs. the direct UK real estate market when including 30% listed allocations. We believe that this is surprisingly small given that the listed element comprises global rather than purely UK stocks. We also find that c. 1.3% tracking error arises for a well-diversified unlisted portfolio highlighting that pure IPD index performance is unachievable. This tracking error rises to 2% if subscription costs are included.
- **Currency impact:** We found that the annual difference in returns and volatility between a hedged and an unhedged global listed portfolio over the 15 year period of the study was not material.
- **Cash drag:** We found that the impact of adding a 5% cash buffer to the portfolio was to reduce annualised returns over the period by 0.6%, from 7.7% p.a. to 7.1%, and reduce volatility from 8.4% to 8%.
- **Risk attribution:** While the volatility of listed exposure is well-known, it is equally well-recognised that the true volatility of unlisted funds is greater than commonly stated. We refined our measurements for risk by accounting for non-normalities and valuation smoothing and found that unlisted funds contributed to a greater share of overall risk.
- **Portfolio contribution.** We modelled the impact of using our DC Real Estate Fund rather than 100% unlisted exposure in a mixed asset portfolio of equities and bonds. The impact was extremely similar, and marginally better if unsmoothed data was used as a comparable, modestly raising the Sharpe ratio for the mixed asset portfolio over the 15 year period, whether a 10% or 20% real estate weighting was used. ■

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Listed and direct
real estate investment:
A European analysis

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Category: Performance, Asset insight

Keywords: returns, listed real estate, direct real estate, valuation, transactions

18 Listed and direct real estate investment

A European analysis

This study investigates the extent to which returns from the listed real estate sector are related to returns in the direct real estate market for the US and for six European countries: France, Germany, the Netherlands, Sweden, Switzerland and the UK.

Past research has often used valuation based indices for the direct real estate market, but these are criticised with regard to their perceived smoothing and lagging of market performance. In contrast, this study uses transaction based/linked indices of direct real estate prices, as well as valuation based ones for the purpose of comparison. Returns, standard deviations, correlations and peaks and troughs are compared before the techniques of spectral and cross-spectral analysis are used for examining the cyclical attributes of the data.

The main findings from the research are as follows:

- Transaction-based series are more volatile than their valuation-based counterparts and thus imply a smaller difference in volatility between direct real estate and the listed sector. Other factors such as gearing and the different trading environment continue to distinguish indices for each form of real estate.
- Movements in listed sector returns lead those in the direct market regardless of whether a transaction or valuation based series is used for the latter. Hence, the lead is not solely due to valuation smoothing. The extent of the lead varies; it is two to four quarters in France, the Netherlands, Sweden and the US, and zero to two quarters in the UK.
- In terms of the recent major cycle, listed sector indices exhibited both an earlier peak (either Q4 2006 or Q1 2007) and an earlier trough (Q1 2009) than their direct market counterparts. This is consistent with the idea that price discovery occurs first in one market and then in the other.

- Spectral analysis suggests cycles of 5.5 years (22 quarters) for several listed sector series, but similar cycles are not found for the direct market. Nonetheless, cross-spectral analysis shows that the degree of coherency (analogous to correlation) between direct and listed real estate rises when longer term movements in the series are analysed.
- Throughout the analysis, results for Germany and Switzerland differ from those for the other countries. Here, there are low correlations between all three series and little visual similarity other than an absence of a cycle in the different direct market series. The reasons behind this require more research.

The results of the study largely support conclusions from earlier research, despite the switch to using transaction based indices. However, similar long run trends and cycles should be expected in the two types of direct market series; ultimately, they track the same market. Further explanations relate to aggregation and recording issues, and variations in liquidity. The other contribution of the study is to widen the spatial scope of research in this area.

What was our motivation? The relationship between the performance of listed real estate companies and the underlying real estate markets in which they invest is a topic that has important implications for property pricing and investment strategies. Similarities in performance would suggest that the two can be regarded as substitutes in a portfolio context, leading investors to allocate capital between these alternatives based on preferences for aspects such as liquidity and control, as well as the amount of capital that is available. Moreover, owing to their greater liquidity, investments in the listed sector enhance the scope for tactical allocations in real estate. Yet empirical research has generated mixed findings as to whether these two forms of real estate do produce similar patterns of returns.

The reasons for different results include variations in the countries and periods studied, the methods used and the short term or long term

focus of the analysis. However, one feature of most studies to date is their reliance on valuation based indices as measures of direct real estate performance. Such indices have been challenged on the grounds that they appear to understate the volatility of real estate and may not reflect market turning points in a timely manner. These issues stem from the processes of property valuation and may be affected by how valuations are aggregated into market indices. More recently, though, transaction based series of investment property prices have become available and these have stimulated new research to establish whether earlier conclusions on the relatedness of direct and listed real estate remain valid.

This study compares the performance of listed real estate with both valuation and transaction based measures of direct real estate for a sample of countries where all three types of series are available. It reports basic descriptors of performance and relatedness, such as means, standard deviations and correlations, as well as results from the more sophisticated methods of spectral and cross-spectral analysis, which identify and compare the cyclical properties of time series. The countries studied are France, Germany, the Netherlands, Sweden, Switzerland, the UK and the US. Thus, the study adds to research that uses transaction based indices while also widening the spatial scope of research in this field by increasing the limited amount of evidence that exists for mainland European countries.

The rest of the report is structured as follows. In the next section, the sources of difference between listed and direct real estate investment are reviewed and previous evidence on their relationship is discussed. Section three then outlines the methods of spectral and cross-spectral analysis before the fourth section discusses the datasets used in this study. Section five presents the results from the empirical analysis and this is followed by reflections on these results in the conclusion. ■

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REIT capital structure:
Real risk-adjusted
performance and
the management of
exposure to inflation

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Category: Performance, Inflation hedge

Keywords: inflation hedging, leverage, cross-sectional variation

19 REIT capital structure

Real risk-adjusted performance and the management of exposure to inflation

We study the interrelationships between real risk-adjusted returns to REIT firm equity, inflation hedging characteristics of investments in firm equity, and corporate capital structure choices, in the presence of nominal and real assets and liabilities. We argue that, *ceteris paribus*, firms can choose an optimal capital structure that maximises real risk-adjusted performance by implicitly hedging the real value of firm equity against erosion through unexpected inflationary shocks.

Background

Investors are commonly thought to maximise expected utility over immediate consumption and terminal wealth to fund future consumption. However, the ability to consume out of wealth is determined by its real purchasing power. Moreover, investors are typically concerned about the efficiency of an investment relative to the risk. Therefore, firm managers may be interested in maximising real risk-adjusted returns to firm equity.

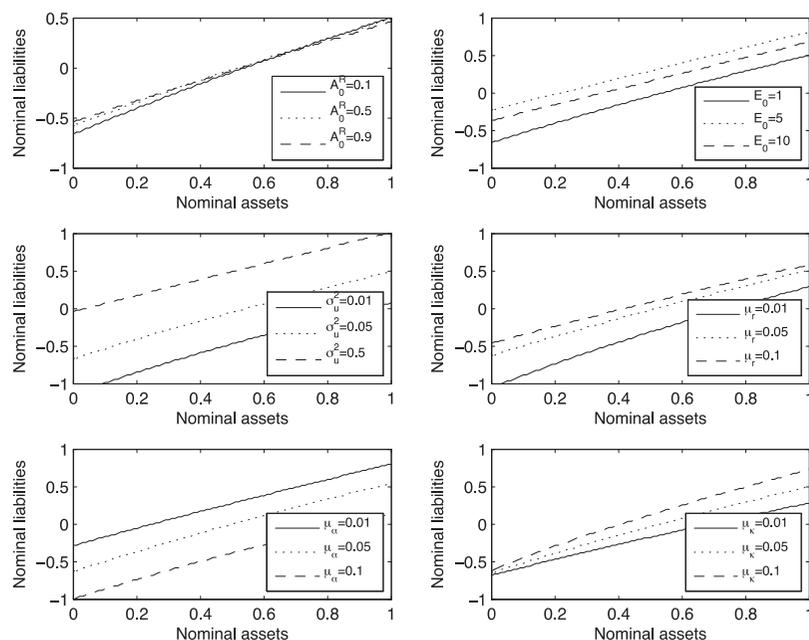
Method

We model the real risk-adjusted return to firm equity in the presence of real and nominal assets and liabilities using the real Sharpe ratio. We argue that managers can maximise this measure by holding nominal (fixed-rate) debt and nominal assets (proxied by the NAV of the firm) in a directly proportional relationship. We show that adhering to this simple capital structure rule supports real risk-adjusted performance because it is equivalent to hedging the real value of firm equity against unexpected inflationary shocks.

Results

We test the empirical implications of our model using a large sample of US equity REITs over the period 1989 to 2011. We find that managers

Simulation results for SRR



appear to adhere to the positive linear relationship between nominal assets and liabilities we propose. As we expect, firms that adhere to the proposed relationship appear to outperform their peers in terms of their real risk-adjusted performance as measured by the real Sharpe ratio. Consistent with the implication of our model, firms that adhere to the proposed relationship between nominal assets and liabilities also appear to provide a stronger hedge against inflation than their peers. We find additional support for the notion of nominal liabilities as a buffer against inflationary shocks by providing evidence that firms hold more nominal liabilities in times of higher inflation uncertainty.

Conclusion and practical implications

We provide evidence that firms can successfully maximise real risk-adjusted performance by matching nominal assets and liabilities. The underlying mechanism relies on implicitly hedging the real value of firm equity against unexpected inflationary shocks. Our results imply that investors can extract information about inflation hedging capabilities from capital structure data, promoting more efficient investment decisions. Leverage-constrained investors benefit from the management of inflation risk at no extra cost to unconstrained investors. We view the findings of this study largely in the context of the REIT capital structure and inflation hedging literature. We provide insight into the question why tax-exempt REITs may hold more leverage than theory suggests. REIT leverage choices may be a function of efforts to manage real risk-adjusted performance. We further contribute to the debate about the inflation hedging characteristics of REITs as a securitised form of real estate. We highlight the importance of cross-sectional variation in these characteristics and relate them to firm-level differences in corporate capital structure choices.

The study provides the conceptual background for this study, followed by an outline and derivation of our model of real risk-adjusted performance. We then develop empirically testable implications of the model. We provide details on data and methodology underlying the empirical analysis and subsequently discuss the main empirical findings alongside their practical implications. ■

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Are listed real estate stocks
managed as part of the
real estate allocation?
A survey report for EPRA

The authors



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Category: Performance, Allocation

Keywords: liquidity, compliance, risk regulation, education

20 Are listed real estate stocks managed as part of the real estate allocation?

A survey report for EPRA

Executive Summary

There has been a significant amount of research in recent years, produced by both academics and practitioners, which has focussed in particular on two areas. First, much attention has been paid to the investment merits of listed real estate as part of a mixed-asset portfolio; second, academics and investment firms have explored the relationship between the performance of the listed sector and both direct real estate and unlisted real estate funds.

The conclusions are broadly consistent, as follows.

First, REITs can act as both a return enhancer and diversifier in a mixed asset portfolio (Lee, 2012), and adding listed real estate to an unlisted portfolio can enhance returns as well as liquidity (*NAREIT, 2011*).

Second, while listed real estate returns do not reflect direct or unlisted real estate returns in the short run (one to two years), listed real estate and direct real estate are more correlated or co-integrated over the medium to longer term (three and more: see, for example, *Hoesli and Oikarinen, 2012*).

Third, listed real estate performance appears to lead direct market indicators by around six months (Cohen and Steers 2009), although whether this lag is capable of being exploited to deliver abnormal or excess returns is questionable (Baum and Hartzell, 2012).

The first and second of these findings suggests that listed real estate should be attractive to investors, especially pension funds interested in the longer term. The global financial crisis of 2007-9 and the associated price and liquidity collapse of illiquid real estate assets over that period should arguably have led to an increase in listed real estate allocations at the expense of privately held assets. However, no significant change in behaviour has been observed. There may be many reasons for this, some of which are likely to be behavioural, or institutional, rather than purely based on rational economics.

Until now, however, there has been little work published regarding done the behavioural or institutional aspects of incorporating listed real estate into an investment strategy. To rectify this gap we have undertaken two pieces of research for EPRA. The first, published in March 2013 (The use of listed real estate securities in asset management), examined both the different strategies and the various fund types available to investors who are prepared to use listed real estate, citing a number of examples, and how listed real estate is or may be combined with other types of real estate and real assets. These other assets include internal and external unlisted funds (the product of the investor or a third party asset manager), derivatives, property debt, direct property, and real assets such as infrastructure and commodities in their various forms.

This second piece of work is a logical extension of the first paper, and concentrates on survey evidence examining whether or not listed real estate is managed as part of the overall institutional real estate allocation. Our starting point is as follows. If there is a strong rational case for including more listed real estate in multi-asset or real estate portfolios, and if there is little evidence that this is happening, then there may be an explanation which is to do with the organisational structures or investment processes employed by investors or sub-contracting asset managers. Hence, while we might recognise the apparent benefits of listed real estate noted above, it is important to

understand and capture the organisational processes that determine whether European investors do include listed real estate in their real estate portfolios - and, if not, we would like to know why not. To the extent to which investors do utilise listed real estate, we would like to understand what (if anything) limits the weight they place on listed real estate. ■

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**The performance effects
of index composition changes**
Empirical evidence from
the European listed
real estate sector

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Category: Performance

Keywords: price, trading volume, liquidity, long-term impact

21 The performance effects of index composition changes

Empirical evidence from the European listed real estate sector

This paper examines the impact of changes in the composition of real estate stock indices, considering companies both joining and leaving the indices. Stocks that are newly included not only see a short-term increase in their share price, but trading volumes increase in a permanent fashion following the event. This highlights the importance of indices in not only a benchmarking context but also in enhancing investor awareness and aiding liquidity. By contrast, as anticipated, the share prices of firms removed from indices fall around the time of the index change.

The fact that the changes in share prices, either upwards for index inclusions or downwards for deletions, are generally not reversed, would indicate that the movements are not purely due to price pressure, but rather are more consistent with the information content hypothesis. There is no evidence, however, that index changes significantly affect volatility of price changes or their operating performances as measured by their earnings per share. ■

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**Commercial
real estate investment**
Co-integration and
portfolio optimisation

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Category: Performance, Asset insight

Keywords: liquidity buffer, optimal portfolio, complementarity

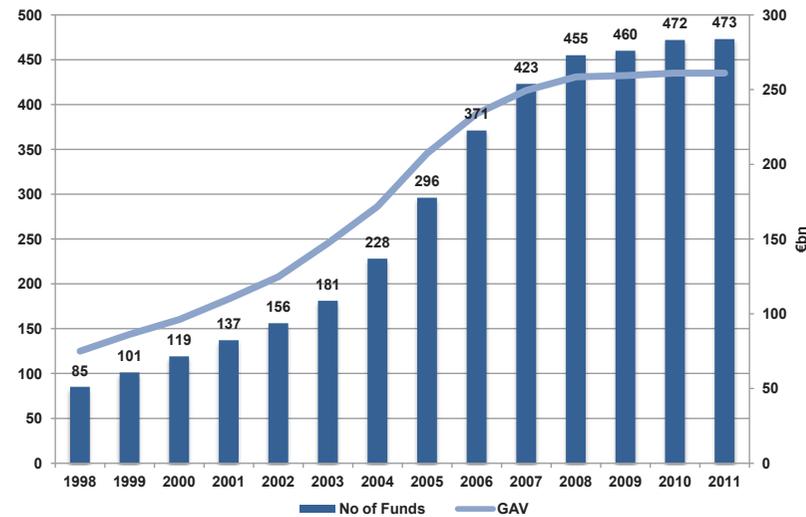
22 Commercial real estate investment

Co-integration and portfolio optimisation

The question if listed real estate constitutes a viable proxy for direct real estate investment is long-standing and actively debated. A number of studies (predominantly in the US) have explored the investment attributes and dynamics of listed real estate relative to direct markets with varying results and interpretations.

This study builds upon previous EPRA research including that of Sebastian and Schatz (2009) to expand the knowledge base applying

Number and value of European non-listed real estate funds



a cross-jurisdictional methodology framework comprising France, Germany, Netherlands, Sweden, UK, Pan-Europe, Australia and the US to extenuate the nature and role of the different forms of real estate investment mediums within the confines of a multi-asset investment portfolio. Notwithstanding the turbulent period of readjustment in the global real estate market post-GFC this report highlights the enduring characteristics of real estate as an asset class depicting long-term outperformance in key investment markets relative to bonds and equities. Moreover, direct real estate holdings demonstrate markedly lower levels of volatility relative to equities culminating in enhanced risk-adjusted performance credentials over the period 2002-2011 across a number of key investment markets within Europe as well as in the US.

The conundrum if listed real estate can indeed act as a credible proxy for direct investment is explored extensively utilising a diverse spectrum of analytical techniques. Correlation analysis of total-return performance indicates that listed real estate is closely aligned with direct real estate

performance across the majority of jurisdictions albeit with varying degrees of lagged relationship premised on listed leading the direct market by anything up to one year depending upon jurisdiction. The UK market demonstrated the fastest response time between listed and direct real estate markets and is symptomatic with the relatively high levels of transparency as well as the existence of a monthly direct real estate investment index as measured by Investment Property Databank (IPD). While the analysis did not identify any Granger Causality relationships between listed and direct across the jurisdictions, co-integration analysis suggest trend reverting pricing behaviour in the long-run between both direct and listed real estate markets.

Optimal portfolio analysis serves to further demonstrate the crucial role of real estate within a multi-asset investment portfolio from a diversification perspective and in terms of enhancing portfolio performance over longer term investment horizons across key international investment markets.

In terms of total returns performance the listed real estate sector as expected exhibits higher levels of volatility relative to direct investment. Nonetheless the listed real estate does exhibit superior levels of annualised returns vis-à-vis direct investment in a number of key markets over the long term raising connotations about the weightings allocation and role of direct and listed real estate within the confines of a multi-asset investment portfolio. The construction of a blended real estate investment portfolio comprising direct and listed real estate serves to demonstrate that whilst the respective investment medium are inherently different, they exhibit not just compatibility but complementarity within the confines of an investment portfolio. Indeed in an investment environment governed by a renewed and insatiable appetite for transparency and liquidity listed real estate has the capacity to act as a ‘liquidity buffer’ for investors seeking real estate premised performance attributes. ■

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**Do European real estate
stocks hedge inflation?**
Evidence from developed and
emerging markets

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Category: Inflation hedge

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23 Do European real estate stocks hedge inflation?

Evidence from developed and emerging markets

This report examines the long-run and short-run inflation-hedging properties of real estate stocks for five European markets. The total monthly returns of real estate stocks in the United Kingdom, France, Germany, Poland and the Czech Republic over January 1990 to July 2011 were assessed. Three out of these five markets are categorised as developed markets, while another two are emerging markets.

Developed: United Kingdom, France, Germany

Emerging: Poland, Czech Republic

A comparison of the inflation-hedging effectiveness of real estate stocks in developed and emerging markets allows us to further understand the dissimilarities between emerging and developed property markets, as well as serving as a natural laboratory for evaluating the role of institutional involvement proposition.

There are three overall findings:

1 - It is very difficult to hedge the short-run inflation risk.

It appears that for real estate stock investors, it is very difficult to hedge the short-run inflation risk. The empirical results show little inflation-hedging ability of European real estate stocks over the short run. The results are consistent with the findings of previous studies of US REITs. This also implies that real estate stocks are probably better hedge against longer-term inflation rather than short-term inflation risk.

2 - Real estate stocks in developed markets do provide a positive inflation hedge against expected inflation over the long run.

Strong long-run inflation-hedging results of real estate stocks were evident in the UK, France and Germany, suggesting that real estate stocks in these developed markets do serve as a good hedge against expected inflation in the long run. This reflects that real estate stocks in these markets are effective investment vehicles that warrant consideration for inclusion in institutional portfolios.

3 - The degree of hedging against inflation over the long run is much stronger in developed markets. This can be attributed to a higher degree of participation by institutional investors in these markets.

Our empirical results also show that the degree of hedging against inflation is much stronger in developed markets. Specifically, there is little evidence to support the notion of real estate stocks in Poland and the Czech Republic (emerging markets) can provide a good long-term hedge against inflation, whereas real estate stocks in the UK, France and Germany reveal a strong positive relationship with expected inflation over the long run.

This can be attributed to a higher degree of participation by institutional investors in the developed markets in which a more sophisticated investor base improves information flow and facilitates information gathering (Bradripath et al., 1995, Ziering et al., 1997, Lee et al., 2008); thereby investors will be able to anticipate and incorporate inflation risk into investment returns in the long run effectively. In contrast, given the emerging markets are characterised with less informed and less sophisticated investors, it is not too surprisingly to find that investors in emerging markets fail to do so.

Overall, the results clearly reinforce the role of European real estate stocks in an investment portfolio. The findings could have some profound implications to institutional investors and policy makers.

- Firstly, investors and fund managers should distinguish the impacts of inflation on the short run and long run. Real estate stocks in developed markets are effective risk management tools to hedge the inflation risk over the long run, although no similar evidence is found in the short run.
- Secondly, investors, particularly international property investors should also be aware of the fact that real estate stocks in emerging markets not only have different risk and return characteristics (Barry and Rodriguez, 2004), but also have dissimilar inflation-hedging properties compared to developed markets. The unique inflation-hedging characteristics in emerging markets should also be considered in their investment decision making.
- Thirdly, policy makers should recognise the importance of institutional investors. Importantly, institutional investors would strengthen the information-gathering process and improve the information flow; thereby the inflation-hedging effectiveness of real estate stocks can be enhanced.
- Lastly, European investors in developed markets should consider including real estate stocks in their investment portfolios. European real estate stocks in developed markets are effective investment vehicles in response to the effective inflation-hedging properties over the long run. Therefore, real estate stocks in these markets warrant consideration for inclusion in an investment portfolio. ■

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**The use of listed
real estate securities in
asset management**
A literature review and
summary of current
practical applications

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Category: Asset insight

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24 The use of listed real estate securities in asset management

A literature review and summary of current practical applications

This report examines the use of listed real estate securities in asset management. The study, which is believed to be the first of its kind, takes a two-fold approach: firstly, a critical review of the academic research on the properties and performance of listed real estate which underpins asset allocation decisions, and secondly a comprehensive review of the practical applications of listed real estate in asset management, which highlights the wide variety of investment objectives which they are being used to fulfil.

The key findings are:

Academic evidence

- Although in the short term, listed real estate displays similar risk and return characteristics to the stock market rather than the direct market, recent analysis of the returns over longer (three years) time periods indicate that there is a common real estate factor that drives the returns of both the direct and listed markets, and that pricing in the listed market leads direct market indices.
- In a multi-asset portfolio the inclusion of listed real estate can provide both return enhancement and risk reduction in the portfolio.
- When including both direct and listed real estate in a multi-asset portfolio there is some evidence to suggest that the inclusion of both enhances the overall portfolio return and reduces (i.e. diversifies) portfolio risk.

Practical applications

- **New entrants to the sector:** despite pressures on fund management margins, and an overall slowdown in new funds launched, the attractions of listed real are demonstrated by a number of recent new entrants to the real estate securities fund management. These include Blackrock, Grosvenor Fund Management, Tristan Capital and Internos. The number of real estate securities funds increased 39% to 677 from 2007 to 2012.
- **Income attractions are boosting AuM:** The search for income has led to increased demand for Global REIT funds that can provide a portfolio of above-average dividend yields backed by longer term secure cashflows. As a result Global REIT funds now account for seven out of the ten largest global real estate securities funds. Assets under management of real estate securities funds grew 68% to USD 250 billion from 2007 to 2012. Total assets under management of exchange traded funds (ETFs) pegged to FTSE EPRA/NAREIT real estate indices jumped 85% in the 12 months through to February this year.
- **Increased use of long/short strategies:** These first came to prominence in 2006/7, but as a group did not survive the global financial crisis. Evidence shows that long/short strategies are returning to favour, being employed by traditional long-only specialist asset managers such as Thames River, as well as new entrants to the market.
- **Listed real estate securities are being used as a proxy for real estate investment:** Recent mandate awards include one from the National Council for Social Security Fund of China, which was prohibited from investing overseas until 2006, and targets global REITs as a liquid, tax-efficient proxy for the global real estate market.
- **Platform investing:** traditionally the concept of platform investing (allocating money to sector specialist real estate asset managers) was undertaken via the private market, but there is evidence to suggest that this is also being undertaken as a listed real estate strategy. Forum Partners have executed this strategy globally, with over 70 investments in 17 countries.
- **Listed real estate is a key component of new Defined Contribution strategies in the UK.** Auto-enrolment into Defined Contribution schemes in the UK is now underway and one of the biggest challenges for the industry is how to provide a suitable real estate platform for DC schemes. Legal & General have provided a solution, by combining their managed property funds with a Global REITs Index Tracker Fund.
- **Demand is increasing for real asset (or inflation protection) funds, which include listed real estate.** A good example is Cohen & Steers Real Asset Fund which holds 25%-30% in global real estate, 25%-30% in commodities, 15%-25% in global natural resource equities and up to 20% in other assets such as gold. ■

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