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Explaining REIT Returns

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Abstract
The popularity of real estate investment trusts (REITs) as an investment vehicle and the current record-breaking performance of the stock market in the United States have triggered an increased interest in understanding how REITs perform relative to other investments. Numerous research studies examine whether REITs behave like stocks and bonds and have worked to identify factors that impact REIT returns. Others examine the asset pricing structure of various assets, including REITs, to identify predictive information useful for investors. In this study, we organize this literature into five categories and provide summary information on each area. The categories are: (1) valuation models and REIT returns, (2) REIT return volatility, (3) REIT returns and asset growth, (4) the impact of financial leverage on REIT returns, and (5) REIT returns and investor sentiment. Results are aggregated into a framework highlighting findings that are useful in explaining the REIT return behavior.

Keywords
REIT returns, volatility, investor sentiment, asset growth, valuation models

There is considerable interest in real estate investment trust (REIT) returns, with the overarching umbrella being the integration of REIT returns with stock and bond returns. Several studies find that REITs and stocks share some common asset factors. For example, Glascock, Lu, and So (2000) examine the integration of REIT, bond, and stock returns and find that REITs behave more like stocks and less like bonds after the structural changes in the early 1990s. They find that the benefits of including REITs in multi-asset portfolios diminished after 1992; however, after 1992, stocks and REITs share some common factors and REITs behave more like stocks. In a related study, Clayton and MacKinnon (2001), examining the sensitivity of equity REIT returns to returns on other asset classes, find that, during the 1990s, REITs began to exhibit a direct link to real estate returns and a sensitivity to small cap returns (especially during REIT market downturns). In a follow-up study, Clayton and MacKinnon (2003) confirm that the REIT market went from being driven largely by the same economic factors that drive large cap stocks through the 1970s and 1980s to being more strongly related to both small cap stock and real estate-related factors in the 1990s. Finally, Li and Wang (1995) find that the REIT market is integrated

with the general stock market and they find no evidence that REIT returns are more predictable than the returns of other stocks.

Numerous studies examine the factors that drive REIT and real estate property values. Given that REITs share some asset pricing structure with other assets (such as stocks and bonds), there are a number of possible factors that can affect REIT return behavior. Several of these REIT return factors have received particular focus. The purpose of this paper is to examine these critical areas and form a cohesive discussion of how these areas collectively affect REIT returns. This should provide a basis for better understanding the foundation upon which REIT returns rest. The areas discussed in this paper include: (1) valuation models and REIT returns, (2) REIT return volatility, (3) REIT returns and asset growth, (4) the effect of financial leverage on REIT returns, and (5) REIT returns and investor sentiment.

Valuation Models and REIT Returns

The importance of accurately valuing REITs and real estate properties has become a robust area of discussion since the last financial crisis. There is a large branch of literature on valuation models and other predictors of real estate returns in an effort to minimize future valuation error of real estate properties. In this section, we discuss several valuation methodologies and common variables that affect REIT valuation.

In an early study, Gyourko and Keim (1992) find that the lagged values of traded real estate portfolio returns are accurate predictors of returns on the appraisal-based index, after controlling for persistence in the appraisal series. This implies that the information about real estate markets reflected in the stock exchanges is later imbedded in infrequent property appraisals.

Clayton and MacKinnon (2001) use a multi-factor model to examine the sensitivity of NAREIT returns to large and small cap stock returns, bond returns, and returns to un-securitized real estate. They find over the sample period that returns display the greatest sensitivity to bonds and both large- and small-cap stocks. However, the relation between REIT returns and the other investments changed over time and appeared to be cyclical in nature. In a similar study, Fei, Ding, and Deng (2010) use the AG-DCC GARCH model to compare the performance of REITs to un-securitized real estate and stock returns. They find little asymmetry in the correlations among returns from REITs, direct real estate, and stock. In a more recent study, Seguin (2016) uses several estimators to compare the equity claims of public non-listed REITs to those of listed REITs. Although market-based equity prices for public non-listed REITs were not available, the author concludes that equity claims are worth between 23% and 80% less than the equity claims of listed REITs.

Several studies present myriad estimation models that seek to define the most accurate valuation of REITs. Kim and Jang (2010) use CAPM to identify the risk and return characteristics of hotel REITs and C-corps. Using single-factor CAPM and Fama-French three-factor models, the authors find little evidence that hotel REITs have significantly different risk-return characteristics from hotel C-corps. Using CAPM and

GARCH models, Asteriou and Begiazi (2013) also examine REIT returns and volatility. Their findings suggest the stock market has a significant impact on REIT returns but does not significantly impact the day-of-the-week effect. This means that there is no significant risk diversification potential between REITs and common stocks.

Buttimer, Chen, and Chiang (2012) use a classical regression-based framework to examine the performance and market timing ability of equity REITs. They find that pure index models may not accurately capture the dynamics of REIT returns. Equity REITs in aggregate have some housing market timing ability but various subcategories of REITs do not. For example, retail, industrial, and office REITs have poor market timing ability. Chiang (2015) examines factors that drive REIT prices using a dividend pricing model. He finds that the ability of new information about dividend growth and discounts rates to explain REIT prices tends to evolve over time as the markets digest the new information. Specifically, his results show that during the vintage REIT era (1980–1992), expected aggregate REIT dividend growth is predictable from aggregate REIT dividend yields. This is true for both the short and long run time horizons, and the predictive relation is negative. However, in the new REIT era (1993–2011), there is a positive predictive relation from dividend yields to aggregate REIT returns. Chui, Titman, and Wei (2003a) use cross-sectional regressions of characteristics on REIT returns and find determinants of returns differ between the pre- and post-1990 periods. Specifically, in the pre-1990 period, momentum, size, turnover, and analyst coverage are predictors of REIT returns while in the post-1990 period, momentum is the dominant factor that predicts REIT returns. In another study, Chui, Titman, and Wei (2003b) examine intra-industry momentum and also find a stronger momentum effect during the post-1990 period than during the pre-1990 period. This stronger effect appears to be attributed to several possible factors, including more valuation uncertainty after 1990.

Hung and Glascock (2008) examine the momentum effect in different market states and find that the momentum returns of REITs are jointly explained by a time-varying market state factor and a cross-sectional variance in dividend yields. A later study, Hung and Glascock (2010) examine REIT returns over the 1993–2009 period and find that controlling for momentum, book-to-market ratio, institutional ownership, and illiquidity are highly correlated with REIT returns; in contrast, size and analyst coverage are not correlated with REIT returns (Goebel, Harrison, Mercer, and Whitby, 2013). This study also finds the characteristic-return relations are strongly influenced by market interest rates. Bond and Xue (2017) develop an investment-based asset pricing model for REITs. They find that two fundamental factors enhance predictive power in explaining REIT returns: investment and profitability. They assert that the investment-based model provides more predictive power than conventional models.

Li (2016) examines the time series properties of the expected returns for REITs to determine whether there are implications for investor portfolio choices and information for fund manager performance evaluations. Using a conditional covariance-based three-factor pricing model and a REIT index-enhanced four-factor model, the author finds expected returns on REITs are related to their own volatility and to the covariance with the Fama-French factors. These results differ from previous

studies since they suggest that expected REIT returns are not compensation for their own volatility but compensation for the risks associated with the stock market premium and the value premium. The results suggest that the market for REITs is integrated with the general stock market.

Graham and Knight (2000) use cash flows and income for valuing equity REITs and employ three models to test the relation between price to earnings and cash flows. They find that funds from operations (FFO) provide a more accurate predictive value of REITs than net income. In a similar vein, Ling and Naranjo (2003) examine whether cash flows impact REIT prices and returns and whether that impact is temporary or permanent. Using vector autoregression (VAR), they find that REIT equity cash flows have a significant positive relation to the prior quarter's cash flows but are negatively related to cash flows from two quarters earlier. These findings indicate a positive momentum in REIT cash flows; however, this momentum reverses after two quarters. In a more recent study, comparing valuation error of REITs and non-REITs, Yang (2013) uses a return decomposition model that differentiates returns driven by cash flow news as opposed to expected return news. The author concludes that REIT returns are impacted by cash flow news during a time of pre-regulation, but that returns are driven more by expected returns (based on investor perception) in a post-regulation period.

In summary, some major points relative to valuation models and REIT returns include:

- Real estate market information that is reflected in stock market exchanges impacts real property appraisals (Gyourko and Keim, 1992).
- REIT returns incur high levels of sensitivity to bonds and both large and small-cap stocks (Clayton and MacKinnon, 2001).
- Correlations among returns from REITs, direct real estate, and stocks exhibit little asymmetry (Fei, Ding, and Deng, 2010).
- Equity claims on public non-listed REITs are worth 23%–80% less than the equity claims of listed REITs (Seguin, 2016).
- Hotel REITs have similar risk-return characteristics as hotel C-corps. (Kim and Jang, 2010).
- The stock market has a significant general impact on REIT returns but has little impact on the day-of-the-week effect (Asteriou and Begiazi, 2013).
- Pure index models do not correctly describe the performance and market timing ability of equity REITs (Buttimer, Chen, and Chiang, 2012).
- There is a difference in predictive relation from dividend yields to REIT returns in the vintage-REIT era (1980–1992) versus the new REIT era (1993–2011) (Chiang, 2015).
- Expected REIT returns compensate for general stock market risk and not that particular REIT's own volatility (Li, 2016).
- Funds from operations (FFO) information is a better indicator of returns than net income (Graham and Knight, 2000).

- In pre-regulation periods, REIT returns reflect cash flow news but in post-regulation periods, REIT returns reflect investor expectations of returns (Yang, 2013).
- Returns in the pre-1990 period are impacted by momentum from past returns, size, turnover, and analyst coverage, while after 1990, momentum is the dominant predictor of REIT returns (Chui, Titman, and Wei, 2003a).
- The intra-industry momentum effect is small prior to 1990, but is relatively large after 1990, with a profit of 1.33% per month (Chui, Titman, and Wei, 2003b).
- The momentum returns of REITs can be explained by both time-varying market state factors and a cross-sectional variance in dividend yields (Hung and Glascock, 2008).
- When controlling for momentum, book-to-market ratio, institutional ownership, and illiquidity are highly correlated with REIT returns; size and analyst coverage are not correlated with REIT returns (Goebel, Harrison, Mercer, and Whitby, 2013).
- Two fundamental variables, investment and profitability, are highly predictive of REIT returns (Bond and Xue, 2017).

VOLATILITY OF REIT RETURNS

A number of studies have examined the volatility of REITs and direct real estate returns. In an early study, Ross and Zisler (1991) compare returns and risk for unleveraged equity REITs with stocks and bonds. They find that the aggregate return for the equity REITs is nearly twice that of the other assets but that the equity REIT is far more volatile. Giliberto (1993) uses a ''hedged'' REIT index to measure volatility in real estate returns. His results show that the volatility in equity REITs has a significant influence on other asset classes. He finds that REITs are generally more strongly influenced by the volatility of small cap stocks and firms classified as value stocks.

Stevenson (2002) examines the relation between the volatility of various equity and fixed-income sectors in the U.S. financial markets and the volatility of REITs. His results show that the volatility in equity REITs has a significant influence on the other subsectors of the market and that the REIT sector is generally influenced more strongly by volatility in small cap stocks and in firms classified as value stocks. However, Cotter and Stevenson (2006), examining the relations between different REIT sectors using daily data, find the linkages between REITs and related sectors (such as value stocks) less evident. The volatility dynamics of daily returns are further examined in Cotter and Stevenson (2007). In this study, they conclude that daily data provide some opposing volatility spillover results than those reported earlier in Stevenson (2002). Cotter and Stevenson (2007) find that the results from earlier studies are harder to capture when daily data are used. Anderson, Clayton, MacKinnon, and Sharma (2005) show that REITs have both a significant small capital value component

and a large sector-specific component. They show that REIT return volatility is not highly related to small capital growth stocks and that the contribution of large capital stock drivers to REIT volatility has declined over time. The authors also find that, when examined on a monthly basis, private real estate returns play a small role in explaining REIT volatility. The predictive power of REIT volatility is further examined in Diavatopoulos, Fodor, Howton, and Howton (2010). These authors examine the information content found in both implied total volatility and implied idiosyncratic volatility for REITs and find these measures for REITs are similar to those of other list equities. This study highlights the predictive power of both volatility measures in predicting future realized volatility.

Li and Wang (1995), examining the integration of the REIT market with the general stock market, find no evidence that REIT returns are more predictable than the returns of other stocks and that the existing predictability is not explained by the time-varying conditional volatilities of the market return and the default premium. Fei, Ding, and Deng (2010) examine the correlation and volatility of REITs, stocks, and direct real estate returns. For equity REITs, they find a strong relation between correlations and future returns. The higher (lower) correlation between equity REITs and direct real estate, the higher (lower) the future returns of equity REITs. Ang, Chen, Goetzmann, and Phalippou (2014), using a net present value framework to derive private equity realized returns, find that the estimated time series of private equity returns is more volatile than the standard industry indexes.

Some studies have looked at either idiosyncratic risk, asymmetries, or leverage effects in real estate returns. Ooi, Wang, and Webb (2009) examine the role of idiosyncratic (firm-specific) risk in explaining the monthly cross-sectional returns of REIT stocks. They find that idiosyncratic risk dominates the volatility of REIT returns and that conditional idiosyncratic volatility is significant in explaining the cross-sectional returns of REIT stocks. Their results are robust across different idiosyncratic volatility models and different sub-periods. Yang, Zhou, and Leung (2012) examine asymmetries in time-varying volatilities and time-varying correlations among CMBS, (both equity and mortgage) REITs, stocks, and corporate bonds. The authors are the first to document evidence for asymmetric volatilities and correlations in CMBS and REITs. They find that although all the asset returns exhibit asymmetric volatilities, REIT returns exhibit stronger asymmetric volatilities, presumably because of their higher leverage characteristics. Jirasakuldech, Campbell, and Emekter (2009) examine the dynamic behavior of equity REIT volatility using monthly returns. They find that conditional volatility in the equity REIT market changes over time, although the changes are predictable; that the volatility of equity returns is conditional on the volatility in key macroeconomic variables; and that the volatility in equity REIT returns is smaller than that for the small stock index. Contrary to Yang, Zhao, and Leung (2012), there is no evidence of a leverage effect on equity REIT volatility; and there is no evidence that equity REIT expected returns are related to volatility. Using a GARCH-in-mean model in their efforts to include liquidity risk in the pricing model, Hung and Glascock (2010) find momentum returns are higher when volatility is greater. They also find that idiosyncratic risk is higher for REITs with the lowest past returns than REITs with the highest past returns as investors demand a lower risk premium for holding idiosyncratic risk assets.

A couple of studies use data outside the U.S. Pham (2012) examines the dynamics of return and volatility spillovers across the REIT markets of Japan, Singapore, Hong Kong, Malaysia, Taiwan, Thailand, and South Korea. The emerging markets offer lower returns than the developed markets but lower risk as well. The results further indicate that correlations among emerging REIT markets are lower than that among developed markets. Volatility transmission appears to be multidirectional with Hong Kong, Singapore, and South Korea being the main volatility emitters and Japan and Taiwan being the main volatility receivers. The author argues that the existence of volatility linkages creates favorable portfolio hedging strategies. Lee, Stevenson, and Lee (2014) examine the volatility created by the introduction of index futures in the European listed real estate market. They find no evidence indicating that the introduction of futures contracts has led to an increase in underlying volatility. Rather, their results show that futures trading has led to an improvement in the information flow in the European listed real estate sector. The authors also find that the negative relation between the volatility of real estate equities and the expected futures trading volume and open interest confirms the stabilizing role of futures trading.

In summary, some major points relative to volatility and REIT returns include:

- Equity REITs are more volatile but have nearly twice the return of other assets examined (Ross and Zisler, 1991).
- The volatility in equity REITs significantly impacts other asset classes (Giliberto, 1993).
- Equity REIT volatility strongly impacts other equity and fixed-income subsectors of the U.S. financial markets (Stevenson, 2002). Later, Cotter and Stevenson (2007) do not capture the same results using daily return data.
- The relation between different REIT sectors and other investments such as stocks is less pronounced on a daily returns basis (Cotter and Stevenson, 2006).
- Volatility in REIT returns is not significantly related to small capital growth stocks and its correlation with large capital growth stocks has declined over time (Anderson, Clayton, MacKinnon, and Sharma, 2005).
- The volatility of REITs has significant predictive power; both implied total volatility and realized total volatility are highly correlated to future realized volatility (Diavatopoulos, Fodor, Howton, and Howton, 2010).
- The returns of REITs are no more predictable than the returns of other stocks (Li and Wang, 1995).
- The higher/lower correlation between equity REITs and direct real estate results in higher/lower future equity REIT returns (Fei, Ding, and Deng, 2010).
- Idiosyncratic risk dominates the volatility of REIT returns and conditional idiosyncratic volatility impacts the cross-sectional returns of REIT stocks (Ooi, Wang, and Webb, 2009).

- Momentum returns inherently have asymmetric volatility, as they are higher when volatility is higher; higher idiosyncratic risk is associated with lower past returns; additionally, investors demand a loser risk premium for holding REITs with lower idiosyncratic risks (Hung and Glascock, 2010).
- REIT returns experience stronger asymmetric volatilities, likely due to their higher degree of leverage (Yang, Zhou, and Leung, 2012). Later, Jirasakuldech, Campbell, and Emekter (2009) find no leverage effect on equity REIT volatility and no indication that equity REIT returns are related to volatility.
- Emerging REIT markets generate lower returns and lower risk than developed markets (Pham, 2012).
- Introducing futures contracts into the market does not lead to an increase in volatility (Lee, Stevenson, and Lee, 2014).

ASSET GROWTH OF REITS

REIT returns, as measured by both dividend performance and overall growth, have been examined in a wide body of research. In this section, we examine research on the returns and growth of REITs that are organized into two broad categories: (1) internal factors such as organizational structure, management structure, dividend policy, and diversification; and (2) external factors including monetary policy and systematic risk.

INTERNAL FACTORS THAT IMPACT REIT ASSET GROWTH

The growth of assets held in REITs is often driven by factors that are within the control of the asset manager. Myriad research seeks to understand the factors that influence a REIT manager's decisions regarding management structure, selecting properties, setting dividend policy, diversification, and merger. In an earlier study, Ambrose and Linneman (2001) examine organizational structure, noting that REITs may be categorized into two basic types of operating structures: internally advised and externally advised. Since REITs were originally designed to be passive investment vehicles (similar to mutual funds), they need advisors who are similar to mutual fund managers. These REIT advisors are needed not only to select properties and make investment strategies but also to operate the properties, manage property leases, and finance the properties. Ambrose and Linneman (2001) conclude that internally-advised REITs perform better, primarily due to their superior ability to reconcile conflicts of interest between the REIT manager and the shareholders. Additionally, they find that external REIT managers tend to replicate the performance standards set by internally-advised REITs.

Mooradian and Yang (2001) examine the extent to which REIT dividend and free cash flow policy explain REIT asset growth. Specifically, the authors examine hotel REITs and non-REIT hotel companies and find that hotel REITs retain less free cash flow than non-REIT hotel companies. Additionally, market-to-book value ratio is

negatively related to free cash flow at both before and after dividend levels. They conclude that non-REIT hotels are typically more heavily leveraged and pay lower dividends than comparable hotel REITs.

Other internal factors that impact REIT asset growth are location and merger decisions. Freybote and Qian (2015) examine the impact of property location on the decision to merge and find that REIT managers are more likely to favor merger if their targeted assets are: (1) in primary real estate markets; (2) in strategically important growth markets; or (3) associated within their areas of expertise. The authors ultimately conclude that REIT mergers are motivated by the acquisition of properties in markets that are strategically important to the REIT managers. Ling, Ooi, and Xu (2016) further find that REITs, which are likely to grow outside of their competency areas, are penalized by the market. Additionally, they note that REIT asset growth funded by unsecured debt is associated with negative stock performance during the next twelve months.

Diversification is also examined as an internal indicator of REIT asset growth. Sa-Aadu, Shilling, and Tiwari (2010) find that the timing of real estate growth is one of two asset classes that achieves portfolio gains even when consumption growth is low or volatile (i.e., at times when investors are most concerned with asset growth). In another study, Ong, Lim, and Wong (2016) attribute REIT growth to specific asset enhancement initiatives (AEI), which include initiatives that improve the level and quality of recurring rentals, such as facilities improvement and space reconfiguration. The authors find there is a significant positive wealth effect only for physical AEIs and this increases the top-line rentals, along with the corresponding appreciation in capital asset values.

The impact of dividend policy on the growth of REIT assets has been examined in numerous studies. In one of the earliest studies, Wang, Erickson, and Gau (1993) focus on the impact of dividend policies and the effect of dividend announcements on the performance of REITs. They find that REITs typically pay out more dividends than are required by government regulations. They draw inferences from agency theory and the imperfect information hypothesis and find that the 95% required payout does not fully explain the REIT dividend policy of most REITs. They note that REIT dividend policy is somewhat determined by agency costs and that REIT shareholders prefer high payout ratios because investors use the capital market as a way to monitor management investment decisions. Additionally, they find that the dividend announcement effect for equity REITs is greater than that for mortgage REITs. Hardin and Hill (2008) also examine the excess dividends paid by REITs and confirm that REITs implement a dividend policy that reduces agency costs and seeks to minimize the probability that dividend reductions will be necessary.

In summary, some points relative to REIT returns and internal factors include:

- Internally-advised REITs perform better than externally advised REITs (Ambrose and Linneman, 2001).
- Non-REIT hotels are generally more highly leveraged and pay lower dividends than comparable hotel REITs (Mooradian and Yang, 2001).

- A major motivation for REIT mergers is the potential to acquire properties that are strategically important to the REIT manager (Freybote and Qian, 2015).
- REITs that are considered more likely to expand outside of their competency areas are penalized by the market (Ling, Ooi, and Xu, 2016).
- REIT growth may be attributed to initiatives that improve the level and quality of recurring rentals (Ong, Lim, and Wong, 2016).
- REITs generally pay out more in dividends than are required by regulations (Wang, Erickson, and Gau, 2993).
- The dividend policy for REITs reduces agency costs and minimizes the possibility of the need for future dividend reductions (Hardin and Hill, 2008).

EXTERNAL FACTORS THAT IMPACT REIT ASSET GROWTH

The second category of factors that may impact the asset growth of REITs are external variables including systematic risk, monetary policy, and general performance of the stock market. A couple of early studies examine the impact of REIT asset growth relative to stock market performance. After Gyourko and Keim (1992) conclude that the growth of REITs depends on the stock market's ability to provide correct valuation information to investors, Wang, Erickson, and Chan (1995) follow this up with a study that examines whether the stock market does in fact provide REIT investors with fair and accurate valuation information. The authors show that REIT stocks have a smaller turnover ratio, a lower level of institutional investor participation, and are not followed by as many analysts as the general stock market.

Delcoure and Dickens (2004) compare the systematic risk levels of REITs and real estate operating companies (REOCs). Using beta to measure systematic risk, they find that business risk is negatively related to systematic risk for REITs but that betas are positively related to agency costs for REOCs. The betas for both groups show varying sensitivity to the type and regional location of the real estate property; however, the REIT's beta is also sensitive to financing form and leverage. These results indicate concern for potential agency costs in REOCs but, for REITs, business risk is of somewhat greater importance. Ambrose, Highfield, and Linneman (2005) find an inverse relation between equity betas and firm size. The authors also observe significant economies of scale for all the REITs' cost of capital measures. Topuz and Isik (2009) examine the unusual asset growth and surge in the number of IPOs in the 1990s. They conclude that the efficiency of REITs increased significantly but, in general, REIT productivity declined and technology regressed during the 1990s.

Several studies examine the impact of monetary policy on the performance of REITs. Chang, Chen, and Leung (2011) focus on the impact of changes in the federal funds rate on equity REITs and find a strong non-linearity in the response of equity REIT and housing market returns to the federal funds rate and the interest rate spread. Additionally, in response to either the federal funds rate or the spread, housing market

returns react less significantly but more persistently than REIT returns. Huang and Yeh (2015) examine whether asymmetric transitory shocks significantly impact the housing, REIT, and stock markets from 1976 to 2010. Their results show that these transitory shocks impact all these markets and that the REIT markets have significant permanent shocks. They conclude that monetary policies have weak power in areas that are vulnerable to housing bubbles. This is especially true in New York and Los Angeles in 2007–2008. Bredin, O'Reilly, and Stevenson (2007) examine the impact of unanticipated changes in interest rates using fed funds futures and find that REIT returns and volatility are highly responsive to unanticipated interest rate changes. They also find no evidence of increased volatility associated with Federal Reserve announcements. Chang (2011) finds that unexpected changes in monetary policy significantly impact REIT returns. The author notes that expected changes in monetary policy have less of an impact on REIT returns. In addition, unexpected contractionary monetary policy is found to have a strong adverse impact on REIT returns and this impact is most significant in a bust market. The impact on REIT returns due to changes in monetary policy is also examined by Chen, Peng, Shyu, and Zeng (2012), who also find that during bull markets, changes in monetary policy have a significant adverse impact on EREIT returns when investors are less likely to expect real estate price increases. In volatile bear markets, returns are not sensitive to monetary policy changes.

In summary, some information relative to the relationship between REIT returns and external market factors include:

- REIT growth is contingent on the stock market's ability to provide investors with accurate valuation information (Gyourko and Keim, 1992).
- REITs have lower turnover ratios, less institutional investor participation, and are not tracked by as many analysts as the stock market in general (Wang, Erickson, and Chan, 1995).
- Betas are positively related to agency costs for REOCs but business risk is negatively related to systematic risk for REITs (Delcoure and Dickens, 2004).
- There is an inverse relation between equity betas and firm size (Ambrose, Highfield, and Linneman, 2005).
- Equity REIT and housing market returns have a significant non-linearity to the federal funds rate and interest rate spread (Chang, Chen, and Leung, 2011).
- Transitory shocks impact the housing, REIT, and stock markets and REIT markets have significant permanent shocks; monetary policies have a weak impact in areas that are vulnerable to housing bubbles (Huang and Yeh, 2015).
- Unanticipated monetary shocks impact returns and volatility in REITs while there is no evidence of changing volatility behavior corresponding to Federal Reserve announcements. (Bredin, O'Reilly, and Stevenson,

2007). Chang (2011) also finds unexpected changes in monetary policy have a strong impact on REIT returns.

- Monetary policy changes during bull markets have a significantly adverse impact on EREIT prices (Chen, Peng, Shyu, and Zeng, 2012).

FINANCIAL LEVERAGE AND REAL ESTATE RETURNS

Several studies have examined the effect of financial leverage on real estate returns. In an early study, Ibbotson and Siegel (1984) find that unlevered real estate returns fall between those of stocks and bonds over the 1960–1982 period. However, due to the nature of the data over this period, they caution about appraisal smoothing in real estate returns. In a later study, Chan and Hendershott (1990) analyze monthly returns on an equally-weighted index of 18–23 equity REITs. They find that three factors, as well as the percentage change in the discount on closed-end stock funds, consistently drive equity REIT returns: unexpected inflation and changes in the risk and term structures of interest rates. The impacts are greater for more heavily levered REITs than for less levered REITs. They also divide the equity REITs into highly and moderately levered subgroups and the results show that the more levered REITs are consistently more strongly related to macroeconomic factors.

In more recent studies, Ooi, Ong, and Li (2010) examine the role of capital market conditions and target leverage on the marginal financing decisions of REITs. They examine the relevance of a hybrid hypothesis whereby REITs have target leverage, but they also choose and time their marginal financing decisions according to the capital market conditions. The authors find strong evidence that REITs exhibit market timing behavior with respect to entering and exiting the capital market, that REITs have a target capital structure, and that they are more likely to adjust imbalances through debt rather than equity. Overleveraged REITs are more likely to rebalance capital structure by retiring debt. Ling and Naranjo (2015) examine U.S. public and private commercial real estate returns at the aggregate level and by the four major property types. They find that passive portfolios of unlevered core REITs outperformed their private market benchmark. The results seem to indicate that equity REIT returns simply react to fundamental (latent) asset pricing information more quickly than private market returns, probably because of their greater liquidity and transparency.

Giacomini, Ling, and Naranjo (2015b) examine the effects of U.S. REIT leverage decisions on risk and return. They find that REITs are highly levered relative to industrial firms and that over-levered REITs tend to adjust more quickly to close gaps between actual debt levels and target levels relative to under-levered REITs. The authors also find that highly levered REITs tend to underperform REITs with less debt but that REITs with high leverage relative to their target levels perform better on a risk-adjusted basis than under-levered REITs. In addition, they find that highly under-levered REITs (relative to their targets) underperform all other leverage-sorted REIT samples by a wide margin. In a study looking at the Japanese real estate market, Tsai (2013) finds that market returns of Japanese REITs are influenced by leverage, size, and contagion effects simultaneously.

Regarding financial leverage and volatility in real estate returns, Allen, Madura, and Springer (2000) find a significant positive relation between financial leverage and the sensitivity of U.S. REIT returns to general stock market returns. They argue that this is proof that the market risk (beta) of REITs is directly related to firm-level leverage. Chaudhry, Maheshwari, and Webb (2004) show that REIT idiosyncratic risk is affected by financial leverage but that the sign of the relation between the two variables depends on the regression specification. Sun and Yung (2009) estimate the relation between idiosyncratic volatility and expected returns in REITs using various asset pricing model specifications and find mixed evidence on the relation between leverage and REIT volatility.

Sun, Titman, and Twite (2015) examine equity REIT share prices in the years surrounding the financial crisis (2007–2009) and find that these were more volatile than the underlying commercial real estate prices. They separate the pure leverage effect from financial distress and find that REIT share prices with higher debt ratios and shorter maturity debt fell more during the crisis period. The authors also find that REITs with more debt due during the crisis period tended to sell more property and issue more equity. The authors argue that clearly financial leverage played a large role in the substantial decline in REIT prices during the financial crisis. In an earlier study that examines the market downturn in 1989 and 1990, Brown (2000) finds considerable financial distress costs for properties that are highly leveraged, with distress costs being higher for owner-managed firms. The author also finds there is disinvestment in mortgage REITs during a market downturn due to the sale of foreclosed properties and a scarcity of financing. In addition, mortgage REIT returns are found to be more negative than equity REIT returns during a downturn.

Giacomini, Ling, and Naranjo (2015a) examine leverage effects in public real estate markets across eight countries with active public real estate markets. After isolating leverage effects in firm-level returns, the authors find that leverage has a significant effect on returns using standard asset pricing models and that greater use of leverage during the 2007–2008 REIT crisis period is associated with larger share price declines. They also find that levered public market real estate returns are significantly higher and more volatile than unlevered returns over the 2002–2011 period. In a subsequent study of leverage effects on REIT risk and return, Giacomini, Ling, and Naranjo (2017) find that REIT leverage has significant return performance effects and that REITs move rapidly to close the gap between actual debt levels and target debt levels at a pace of 17% annually. They also find that REITs with above average leverage tend to underperform REITs with less debt. However, they find that REITs with high leverage relative to their target levels perform better on a risk-adjusted basis than under-levered REITs.

In summary, some major points relative to REIT returns and the use of financial leverage include:

- Returns of unlevered real estate are between those of stocks and bonds, although the results may reflect appraisal smoothing (Ibbotson and Siegel, 1984).

- Unexpected inflation, changes in risk, the term structure of interest rates, and change in the discount on closed-end stock funds consistently impact the returns of equity REITs (Chan and Hendershott, 1990).
- During the market downturn in 1989 and 1990: (1) mortgage REIT returns were significantly lower than equity REIT returns; (2) there is a significant disinvestment in mortgage REITs due to the sale of foreclosed properties and scarcity of new funding; and (3) mortgage REITs are less likely to reorganize their defaulted loans (Brown, 2000).
- The performance of REITs reflects the market timing of entering and exiting the capital markets (Ooi, Ong, and Li, 2010).
- Equity REIT returns react to fundamental or latent asset pricing information more quickly than private market returns (Ling and Naranjo, 2015).
- Highly levered REITs are likely to underperform less levered REITs (Giacomini, Ling, and Naranjo, 2015b).
- Japanese REIT returns are impacted simultaneously by leverage, size, and contagion effects (Tsai, 2013).
- There is a positive, significant relation between financial leverage and the sensitivity of U.S. REIT returns relative to general stock market returns (Allen, Madura, and Springer, 2000).
- Idiosyncratic risk is affected by financial leverage (Chaudhry, Maheshwari, and Webb, 2004).
- REITs with higher debt levels precipitated by a crisis period are more likely to sell more property and issue more equity (Sun, Titman, and Twite, 2015).
- Financial leverage has a strong impact on returns, and levered public market real estate returns are significantly higher and more volatile than unlevered returns (Giacomini, Ling, and Naranjo, 2015a).
- REITs with above average leverage tend to underperform REITs with less debt; however, REITs with high leverage relative to their target levels perform better on a risk-adjusted basis than under-levered REITs (Giacomini, Ling, and Naranjo (2017).

INVESTOR SENTIMENT

A significant body of research has emerged examining the role of investor sentiment in real estate investment decision-making and its effect on asset pricing in both the unsecuritized and securitized commercial real estate markets. Two strands of literature have developed based primarily on the data used for study: private/public commercial/residential real estate and REITs. The consensus in both lines of research is that investor sentiment plays a significant role in the investment decision-making process.

INVESTOR SENTIMENT AND PRIVATE/PUBLIC COMMERCIAL/RESIDENTIAL REAL ESTATE RETURNS

An early examination of investor sentiment is the ''noise trader'' approach by Barkham and Ward (1999). They examine the discounts of market value from net asset value (NAV) for real estate companies in the United Kingdom. They find that fluctuations of market value from NAV are determined by non-property-related factors and that investor sentiment is a primary determinant in price discounting. In another study using U.K. data, Gallimore and Gray (2002) also find investor sentiment to be a component of decision-making for commercial real estate investors. Using a survey-based approach, they find that investors view investor sentiment as an important form of information. They find that, although investors made extensive use of hard market information, they made almost equal use of their personal feel for the state of the market. The authors find that investors also valued the views of others (commentators, forecasters) and considered those to be useful information in decision-making.

In examining the role of investor sentiment in commercial real estate valuation, Clayton, Ling, and Naranjo (2009) find that institutional investor sentiment affects both pricing and capitalization rates in commercial real estate. They argue that characteristics of the private real estate markets (such as the inability to sell short) make them highly susceptible to sentiment-inducing mispricing. Also examining the private commercial real estate market, Ling, Naranjo, and Scheick (2014) use survey-based investor sentiment measures to examine the relationship between investor sentiment and returns on private commercial real estate. They find that investor sentiment introduces mispricing in the private real estate markets and that this mispricing may persist for prolonged periods of time.

Examining price patterns for U.S. residential real estate, Jin, Soydemir, and Tidwell (2014) find that non-fundamental (irrational) consumer sentiment is significant in the pricing of U.S. residential real estate. Marcato and Nanda (2016), using U.S. data for both the residential and non-residential real estate sectors, find that investor sentiment affects real estate returns in unsecuritized real estate markets and that investor sentiment conveys valuable information that can be helpful in predicting changes in real estate returns. Comparing several sentiment measures to coincident economic indicators, their results suggest that the pure sentiment in the residential sector could convey valuable information when predicting changes in real estate returns. Their results also suggest that there can be significant information gains by using survey-based indices. The authors did not find any significant investor sentiment effects for the non-residential sector.

In summary, some major points in regard to investor sentiment and commercial real estate returns:

- Fluctuations of market value from NAV are determined by non-property-related factors and investor sentiment is a key determinant in price discounting (Barkham and Ward, 1999).
- Investor sentiment plays a role in decisions made by commercial real estate investors (Gallimore and Gray, 2002).

- Institutional investor sentiment impacts both pricing and capitalization rates in commercial property real estate (Clayton, Ling, and Naranjo, 2009).
- Investor sentiment introduces prolonged mispricing in the private real estate markets (Ling, Naranjo, and Scheick, 2014).
- Investment sentiment is useful in predicting changes in real estate returns, especially in unsecuritized real estate returns (Marcato and Nanda, 2016).

INVESTOR SENTIMENT AND REIT RETURNS

Clayton and MacKinnon (2003) show that the average REIT-sector price premium to NAV is at least partially a function of sentiment-based trading on the part of non-real estate investors. The authors find a significant role for investor sentiment in not only REIT prices but also REIT returns and the timing of REIT offerings. Examining the introduction of REITs into the S&P general stock market indices, Ambrose, Lee, and Peek (2007) find support for a spillover effect of non-fundamental factors, such as investor sentiment.

Lin, Rahman, and Yung (2009) examine the impact of investor sentiment on REIT returns by addressing the question of whether investor sentiment affects the return-generating process of successful REITs (high-end performers) differently than that for low-end or middling REITs. Their results show that REIT returns are related to investor sentiment and that when investors are optimistic (pessimistic), REIT returns become higher (lower). They find that this relationship exists across all levels of institutional ownership, except for small REITs. Deng, Hrnjic, and Ong (2014) take a slightly different approach and examine the relationship between investor sentiment and REIT seasoned equity offerings (SEOs). They are especially interested in whether investment sentiment is positively related to pre-SEO overpricing. Their results show that investor sentiment impacts the SEO discounting and underpricing.

Das, Freybote, and Marcato (2015) find that institutional investors rely on institutional sentiment in the REIT bond market. The authors provide a unique approach by combining the literatures on style investing, institutional herding behavior, and flight to liquidity/quality to explain the effect of investor sentiment on institutional REIT trading behavior. Freybote and Seagraves (2017) examine heterogeneous investor sentiment in the commercial real estate market using the hypothesis that investors use the sentiment of other commercial real estate investors as a source of information for their real estate investments. Their study is comprehensive in that they examine institutional investors, publicly traded REITs, and privately held real estate companies. They find that institutional investors rely on their institutional sentiment for CBD office markets but they use sentiments of specialized real estate investors in the suburban office market. Interestingly, they also find that institutional investors rely on both institutional and REIT sentiments for office REIT investments.

In summary, some major points in regard to investor sentiment and REIT returns:

- Investor sentiment impacts REIT prices, REIT returns, and the time of REIT offerings (Clayton and MacKinnon, 2003).
- When including REITs into general stock market indices, there is a spillover effect of variables including investor sentiment (Ambrose, Lee, and Peek, 2007).
- Excluding small REITs, returns on REITs are affected by the optimistic or pessimistic sentiment of investors (Lin, Rahman, and Yung, 2009).
- Investor sentiment impacts the pricing of SEOs (Deng, Hrnjic, and Ong, 2014).
- Institutional investor sentiment is reflected in the REIT bond market (Das, Freybote, and Marcato, 2015).
- Institutional investor sentiment impacts specialized markets, such as CBD office markets and suburban office markets (Freybote and Seagraves, 2017).

CALENDAR ANOMALIES AND REIT RETURNS

Another aspect of investor sentiment in REIT returns that has received vast coverage is calendar anomalies in REIT Returns. These can be summarized as the day of the week effect, January/December effect, turn of the month, and holiday effect.

Day of the Week Effect. Studies of the day of the week effect primarily focus on abnormal returns on Mondays and Fridays. Explanations for these return anomalies vary from weekend information processing to investor mood based behavior. Redman, Manakyan, and Liano (1996) confirm that the Monday anomaly exists for REIT stocks. Chan, Leung, and Wang (2005) consider the intuitional investor impact of a Monday anomaly in the behavior of REITs. They show that REITs with higher institutional holdings on Mondays outperform REITs with lower institutional holdings and that abnormal Monday returns disappear with increased institutional ownership. Hardin, Liano, and Huang (2005) use value-weighted indices and refute the presence of a Monday effect; however, they note a positive Friday effect. A positive Friday return is subsequently demonstrated for both U.S. and European REITs by Lenkkeri, Marquering, and Strunkmann-Meister (2006). Similarly, Brounen and Ben-Hamo (2009) find positive and significant Friday returns for international property companies. Akbulut, Chan, and Letdin (2015), using an updated and larger sample, show that a negative Monday return persists solely in the U.K. and a positive Friday return is present in only two out of 22 countries considered.

Turn of the Month Effect. The turn of the month effect is marked by abnormal returns in the last several days of the months and the first few days of the following months. REITs show a positive turn of the month effect, as shown by Redman, Manakyan, and Liano (1996). Wiley and Zumpano (2009) explore the end of the month effect for U.S. REITs from 1980 to 2004 and find that the anomaly is indeed persistent, for both equal- and value-weighted indices. Their findings are supported by Akbulut, Chan, and Letdin (2015), who find evidence of a significant turn of the month effect in REITs across numerous international markets.

January/December Effect. The January effect is caused by investors putting sell pressure on stocks in December and buy pressure in January. The motivation for investors to sell in December is to dispose of stocks in which they have experienced a loss that they would like to recognize on their taxes. In January the prices recover, resulting in a positive return, known as the January effect.

REITs exhibit a January anomaly as shown by Friday and Peterson (1997) and Redman, Manakyan, and Liano (1996). Brounen and Ben-Hamo (2009), in an international study, find no evidence of the January effect. They note however that the effect was present in the earlier periods, yet disappears towards the latter half of their sample. Hardin, Liano, and Huang (2005) show a significant positive December return for REITs that is driven by dividend payments, and do not find an abnormal capital gains return in either December or January. Both Almudhaf and Hansz (2011) and Hui, Wright, and Yam (2014) document a significant positive December effect in the majority of international REIT indices studied.

Holiday Effect. The holiday effect describes the occurrence of high returns in the days leading up to a holiday. Redman, Manakyan, and Liano (1996) confirm the positive and significant pre-holiday returns for REITs. Hardin, Liano, and Huang (2005), while documenting a positive and significant pre-holiday return in an equal-weighted REIT portfolio, find no evidence for a holiday return in a value-weighted REIT portfolio.

In summary, some major points in regard to calendar anomalies and REIT returns:

- Calendar anomalies such as the Monday effect and Holiday effect, while present in the past (Redman, Manakyan and Liano, 1996), have since disappeared in REITs (Hardin, Liano, and Huang, 2005).
- The turn of the month effect is persistent and particularly strong in international REIT markets (Akbulut, Chan, and Letdin, 2015).
- Positive December returns are observed in both U.S. and international REITs and may be driven by dividend payments (Hardin, Liano, and Huang, 2005; Hui, Wright, and Yam, 2014).

CONCLUSION

In this study, we provide a comprehensive examination of factors that impact the returns of REITs as an investment vehicle. While myriad studies have examined factors that may impact the REIT returns, we present a survey of research that focuses on the factors that have a direct or indirect impact on REIT returns. We organize the results of a wide array of empirical and theoretical studies that examine both the fundamental and non-fundamental factors impacting REIT returns.

We examine over 70 studies to provide a comprehensive and efficient analysis of the behavior of REITs and factors that impact REIT returns. Our results will allow the reader to interpret research on topics such as how REIT returns are valued, the volatility of REIT returns, the behavior of REIT returns and asset growth, how

financial leverage impacts the returns of REITs, and the impact of investor sentiment on REIT returns. Ultimately, we provide a comprehensive, manageable, and useful review of factors that impact the returns of REITs across time, market, and geographical sectors.

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