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Idiosyncratic risk, market risk and correlation dynamics in the US real estate investment trusts

Kim Hiang Liow *, Kwame Addae-Dapaah

Department of Real Estate, National University of Singapore, 4 Architecture Drive, Singapore 117566, Singapore

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ABSTRACT

This study examines total, market and idiosyncratic risk and correlation dynamics using weekly return data on two US REIT firm samples from 1988 to 2008. We find that both market and idiosyncratic variance are time-varying and that idiosyncratic variance represents a dominant component of a REIT firm's total variance. We find a decline in idiosyncratic risk as well as a rise in average REIT correlation during the new REIT era, from 1993 to 2008. This recent downward trend of idiosyncratic risk among REITs is different to the stylized upward trend of idiosyncratic risk among stocks. There is bi-lateral Granger causality between the market and idiosyncratic risks. Finally, we detect a positive relationship between the idiosyncratic risk and expected returns, implying that the risk premium of REITs is positively related to the idiosyncratic risk during the period new REIT era, 1993–2008. Our results have important asset-pricing implications for under-diversified investors.

1. Introduction

This study investigates the dynamics of idiosyncratic risk, market risk and return correlation in the US securitized real estate markets with two samples of real estate investment trust (REIT) firms over the last 20 years, 1988–2008. Although standard asset-pricing theories such as CAPM and APT assert that idiosyncratic risk (i.e., firm-level risk)[1] should not be priced in the expected asset returns, recent surge of interest in idiosyncratic risk of common stocks has generated substantial evidence as to the role of idiosyncratic risk in equity pricing. The main argument supporting this interest is most investors are under-diversified either due to wealth constraints, transaction costs or specific investment objectives; as such idiosyncratic risk may matter to these less well-diversified investors who wish to be compensated with additional risk premium. Accordingly these investors need to consider idiosyncratic risk (together with market risk) when estimating required return and cost of capital on the assets or portfolios. Recognizing that both systematic (market) and idiosyncratic volatility are relevant in stock asset pricing, Campbell et al. (hereafter, CLMX) (2001), henceforth CLMX (2001), analyze long-term trends in both firm-level and market volatility in the US stock markets from 1962 to 1997 and show that a decline in overall market correlation was accompanied by a parallel increase in average firm-level volatility.

Since the US REIT market is a very significant component of the global securitized real estate market, it is important to understand clearly the dynamics of a typical REIT firm's total variance in two different volatility components; i.e., market volatility and idiosyncratic volatility as well as their relative influences on average market correlations and expected market returns. Another point to note is that on average, REITs resemble small capitalization stocks; their owners are individuals or small institutional investors who do not hold a diversified portfolio (Pagliari et al., 2003). As such,

* Corresponding author. Fax: +65 67748684.
E-mail addresses: rstlkh@nus.edu.sg (K.H. Liow), rstka@nus.edu.sg (K. Addae-Dapaah).

[1] Idiosyncratic risk is defined as the risk that is unique to a specific firm, so it is called firm-specific risk. By definition, it is independent of the common movement of the market.

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these investors would value idiosyncratic risk as well. In this paper, we follow CLMX's (2001) unconditional approach to study the time-series behavior and interactions among the total variance, market variance, idiosyncratic variance, average correlations and expected returns; and further, to assess the empirical relation between idiosyncratic risk, market risk and expected return. Specifically, our empirical strategy has two components: (a) understanding the evolution of REITs' total, market and idiosyncratic variance and correlations at the firm level as well as exploring the trends and short-term interactions among the various series and (b) testing the time-series relation between the expected market return and the market/idiosyncratic risk measures of REIT returns, with the results reveal whether there is a positive risk premium associated the market as well as idiosyncratic risk. One can thus view the current study as a complement study to Liang et al. (1995) and Clayton and MacKinnon (2000) on the observed time-series behavior of REIT's risk as well as Ooi et al. (2009) on the relationship between REIT return and firm-specific risk. Specifically, while Liang et al. (1995) are interested in finding out whether both the market beta and interest-rate beta of four US REIT portfolios are time-varying; Clayton and MacKinnon (2000) focus on breaking down the REIT index volatility due to large-cap stocks, small-cap stocks, bonds and direct real estate; Ooi et al. (2009) explore the significance of idiosyncratic risk in explaining the monthly cross-sectional returns of REIT stocks with inclusion of other common explanatory variables including size, book-market ratio and momentum effects. Although some of our results are in agreement with those of the three prior studies, the current paper differentiates itself from existing literature by examining the time-series characteristics of the average individual REIT firm-level risk and correlation measures from a different perspective. Our focus is on providing formal tests on the long-term deterministic trends, evaluating their causality links as well as possible significant relationships between the various time-series risk measures and expected market return (see also Section 2 below on literature review). This is our main contribution to the REIT literature since to our knowledge, even though the CLMX's (2001) decomposition method of unconditional time-series return volatility and correlation has been employed in various stock market studies, this is the first study in the real estate arena that utilizes this methodology to investigate the dynamics of idiosyncratic risk, market risk and return correlation in the US REIT firms over a long period of 20 years. The main appeal of the CLMX's (2001) methodology is its simplicity because the decomposition of volatility does not require the estimation of covariance or beta of the REIT firms. Furthermore, an intuitive average correlation measure can be readily constructed that links it to the market and average stock volatility.

We employ two different REIT samples, one for 1998–2008 (10 years) and the other for 1988–2008 (20 years) to provide a full picture regarding the changing dynamics of the REITs' volatility and correlation over the last 10 and 20 years. In particular, we find that the new REIT era (1993–2008) was characterized by higher market risk and lower idiosyncratic risk. Accordingly average correlations among individual REIT firms have increased. This later downward trend of idiosyncratic risk among REITs is contrasted to the pattern in the time series of idiosyncratic risk in stock markets where CLMX (2001) and Kearney and Potì (2008) find a rise in idiosyncratic risk in the US and European stock markets, respectively. A positive and significant relationship between average idiosyncratic risk and expected market return exists over the new REIT era from 1993 to 2008; however, our results show that market risk does not forecast average market return over the same period. Our findings have relevance for the diversification properties of passive and active international investment strategies that includes the US REIT stocks. Further, REIT corporate management needs to understand and manage better firm-level volatility as it contributes to over 80% of total firm variance over the last two decades.

Our paper is structured as follows. Section 2 provides a brief literature review. Our data set, variable construction and summary statistics are provided in Section 3. In Section 4, we briefly explain the CLMX's (2001) unconditional approach to produce the total variance, market variance, idiosyncratic variance and return correlations and the respective equally weighted series. We perform a range of statistical tests to discern more formally the trends and shock dynamics of the series with Vogelsang's (1998) trend determination, random walk test, Granger causality test as well as variance decomposition methodology, and we explain the regression approach with two stock market crisis dummy indicators and several control variables to detect the empirical relations between market and idiosyncratic risk and average REIT return. Section 5 reports and interpret the various test results to develop the main findings. Finally, Section 6 concludes the study.

2. Literature review

Our literature review reveals that while there is extensive stock market literature documenting the time-series characteristics of idiosyncratic risk and relevant asset-pricing implications, less formal attention is given to equivalent studies of securitized real estate investments such as REITs and real estate stocks where high frequency data are readily available for academics and investors. In what follows, we review several key stock market studies as well as some research papers that have investigated REITs' volatility from different perspectives.

2.1. Stock market studies

CLMX (2001) use a disaggregated approach to study the volatility of the US common stocks at the market, industry and firm levels from 1962 to 1997. They report that idiosyncratic volatility exhibits a significant upward trend, more than doubling whereas market and industry level volatilities are relatively stable over the period. Market volatility tends to lead the other volatility series. In addition, all three volatility series increase substantially during economic downturns and recessions.[2] Consistent with the

[2] CLMX (2001) suggest some possible circumstances that could explain the rise in idiosyncratic volatilities. They include the break-up of conglomerates into more specialized businesses; shift from internal and external capital markets and changes in executive compensation scheme.