



Volatility clustering, leverage, size, or contagion effects: The fluctuations of Asian real estate investment trust returns



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ARTICLE INFO

Article history:

Received 6 August 2012
Received in revised form 15 April 2013
Accepted 17 April 2013
Available online 25 April 2013

JEL classification:

G01
G11
G14
G15

Keywords:

Real estate investment trust
Volatility clustering
Leverage effect
Size effect
Contagion effect

ABSTRACT

This paper analyzes the volatile behavior of index returns in the following Asian real estate investment trust (REIT) markets: South Korea, Singapore, Japan, Taiwan, Hong Kong, Malaysia and Thailand. It also analyzes the conditional volatilities of REIT returns and determines whether any volatility clustering, size, liquidity, or contagion effects exist in their fluctuations. The results indicate that all REIT returns have volatility clustering effects. Moreover, the behavior of the REIT returns in Singapore, Hong Kong, Malaysia, and Thailand are similar, with their fluctuations being caused mainly by the size effect. In Japan, South Korea and Taiwan, the REIT returns are mostly connected with the stock markets because of the contagion effect in these countries. Finally, the Japan REIT market is the most volatile, with its market returns being influenced by leverage, size, and contagion effects simultaneously.

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1. Introduction

The real estate investment trust (REIT) market was created in 1960 following the passage of REIT legislation by the US Congress. Over the years, several changes to the legislation and taxation structures have taken place, which had a significant effect on the US REIT market growth. For example, according to the National Association of REITs, market capitalization in the US REIT market in 2009 was roughly 30 times larger than it was in 1990. While the US has the most mature REIT market at present, the growth in the Asian markets remains significant despite the relatively short history of REITs in Asia. Established in 2001,¹ Japan's REIT market is relatively new and incomparable to that of the US, and yet the market value of the former doubled 10 times faster than that of the latter. Likewise, the REIT markets of Singapore, Hong Kong, Malaysia, Thailand, Taiwan, and Korea have experienced rapid growth. Indeed, REIT markets have immense potential in Asia.

The primary factor that contributes to the rapid growth of the REIT markets is the risk character of the REIT. Usually, REITs are regarded as assets that can reduce portfolio risk because of their low overall risk and low correlation with the stock

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¹ The first REIT in Asia appeared in Japan following the listing of Nippon Building Fund Inc. in the Tokyo Stock Exchange in 2001.

market. Investors include this instrument in their portfolio to preserve the value of wealth and hedge inflation. The rapid growth of the REITs has also attracted the interest of numerous scholars. Several studies have analyzed the risk features of REITs by examining their return volatility (Chaudhry, Maheshwari, & Webb, 2004; Devaney, 2001; Najand, Lin, & Fitzgerald, 2006) and the relationship between the returns of the REIT and stock markets (Bley & Olson, 2003; Chatrath, Liang, & McIntosh, 2000; Chiang, Lee, & Wisen, 2004; Ghosh, Miles, & Sirman, 1996; Goldstein & Nelling, 1999; Gyourko & Linneman, 1988; Gyourko & Nelling, 1996; Li & Wang, 1995; Liu & Mei, 1992; Liu, Hartzell, Greig, & Grissom, 1990; Myer & Webb, 1994; Paladino & Mayo, 1998; Tsai, Sing, Chen, & Ma, 2012).

Several studies have found REITs to be closely related with stock markets (Gyourko & Linneman, 1988; Gyourko & Nelling, 1996; Liu & Mei, 1992; Myer & Webb, 1994; Paladino & Mayo, 1998). However, other studies have found that the relationship between REITs and stock markets varies with time (Ghosh et al., 1996; Sagalyn, 1990)² or shifts depending on market conditions (Chatrath et al., 2000; Chiang et al., 2004; Glascock, 1991; Goldstein & Nelling, 1999).³

Only a few studies, such as McMahan (1994) and Gilberto and Mengden (1996), argue that REITs should behave more like real estate than like stocks; that is, a majority of REIT income flows exclusively from real estate, and REITs and direct property cash flows should be positively correlated. Thus, this idea poses the following questions: does the purported advantage of investing in REITs (that is, low total risk and low correlation with stock markets) actually exist? Moreover, if the fluctuations in REIT returns reflect fundamental changes in their direct property cash flows, why are these returns so volatile? Interestingly, when we use the daily data of REITs, the net asset value (NAV) of the REIT behaves very smoothly. As such, the goal of this paper is to analyze the volatility of REITs, to decompose its conditional volatility, and to determine why they are very volatile. The present study analyze the volatile behavior of index returns in the following Asian REIT markets: South Korea, Singapore, Japan, Taiwan, Hong Kong, Malaysia, and Thailand.

Given that the US REIT market is at least 40 years old, the characteristics of REITs have been the subject of numerous scholarly articles. However, relatively few scholars have examined the performance of the same type of assets in Asian markets. Only a few studies discussed the contagion effect in the Asian REIT or the markets related to real estate. For example, Wilson and Zurbruegg (2004) used correlation analyses to determine whether a contagion effect from the Thailand securitized real estate market to four other Asia-Pacific real estate markets exists. Their results provide evidence of a contagion effect from Thailand to Hong Kong and Singapore between early July and late October 1997.

Liow (2008) investigated changes in the long-term and short-term relationships among the US, UK, and eight Asian real estate securities markets before, during, and after the 1997–1998 Asian financial crisis. Results indicate that market interdependence in Asian real estate securities markets has become stronger since the Asian financial crisis. Tsai and Lee (2012) analyzed whether a convergent behavior exists in the price indexes of the seven Asian REIT markets. They proposed that if the performances of the Asian REIT markets converge, such a connection could be viewed as a contagion effect. The results of the study show that the Asian REIT markets are more connected with the US REIT market than with that of Japan. In addition, the convergent behavior has become more evident since 2007.

Even though research results related to the US REITs are available, predicting whether or when the same market characteristics will appear in newer markets is difficult. Therefore, research related to other newer markets is highly important, particularly in light of the continuing expansion of REIT markets. As such, the present study utilizes data from the Asian REIT markets in observing the volatile behavior of index returns. This article aims to explain the variation in REIT returns by decomposing their conditional variance.

In addition, this paper does not use data from the US REIT market given that two financial crises, namely, the sub-prime mortgage crisis and Lehman Brothers' bankruptcy, have recently occurred in the US. Although the fluctuation and disturbance in the US market was transmitted quickly to other markets, these crises are fundamentally related to real estate and securitized real estate in the US. Thus, even if we were to find that the US REITs fluctuated substantially, this fluctuation may simply be a rational response which reflects fundamental changes in the value of underlying assets. However, the Asian REIT markets, the focus of this study, are different: the underlying market did not change substantially at the beginning of the crisis. Similarly, the Asian REIT markets' daily cash flow and NAV did not change suddenly, which is why the dramatic fluctuation of their daily REIT returns is puzzling. This article attempts to determine whether any financial hypothesis can explain these daily fluctuations.

To observe the fluctuation in high frequency data, we use the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model, which allows for both autoregressive and moving average components in the heteroscedastic variance to obtain the conditional variance (volatility) of the daily REIT returns. By using the GARCH model, the continuity of the volatile

² Sagalyn (1990) used quarterly data from 1973 to 1987 to estimate the capital asset pricing model (CAPM), and the results of the Chow test showed the coefficient between S&P 500 and REITs with significant structural changes. Ghosh et al. (1996) reported that the correlation between the REIT index and S&P 500 dropped from 0.770 in 1985–1987 to 0.401 in 1994–1996, which indicates that the relation between REITs and the stock market, as well as the systematic risk (beta) of REITs, can change over time.

³ These articles used CAPM and the data from the US REIT market to estimate the beta of REITs. The findings by Glascock (1991) show that REIT beta shifts exist with market conditions; betas were higher during up markets and lower during down markets. Such evidence suggests that REIT returns would be less affected during periods of significant market decline. However, Goldstein and Nelling (1999) also found that while REIT betas could shift with market conditions, REITs have higher betas in declining markets than in advancing markets, which is inconsistent with the results of Glascock (1991). The work of Chatrath et al. (2000) and Chiang et al. (2004) showed similar results with that of Goldstein and Nelling (1999), and referred to their findings as the asymmetric REIT-beta puzzle.

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