



Are international securitized property markets converging or diverging?



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HIGHLIGHTS

- We test cointegration among three groups of securitized real estate indices.
- Our new framework can reflect the changes in cointegration dynamics over a period.
- The three groups of markets follow a similar cointegration trend.
- North America is the source of cointegration, while Asia and Europe are recipients.
- This study has important implications to investors and related authorities.

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ABSTRACT

This study establishes a new framework which combines the recursive model with the Fractionally Integrated Vector Error Correction Model (FIVECM) to investigate the cointegration relationship among 9 securitized real estate indices, which are divided into three groups: Asian, European and North American groups. Our new combined framework has the advantage of reflecting the changes in cointegration dynamics over a period of time instead of a single result for the whole period. The results show that the three groups of markets follow a similar cointegration trend: the cointegration relationship gradually increases before the global financial crisis, reaches a peak during the crisis, and dies down gradually after the crisis. However, cointegration among Asian and European countries occurs at a much later time than cointegration among North American countries does, showing that North America is the source of cointegration, while Asia and Europe are the recipients. This study has important implications to investors and related authorities that investors can adjust their portfolio according to the test results to reduce their risk, while related authorities can take appropriate measures to stabilize the economy and mitigate the effects of financial crises.

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1. Introduction

For long, the real estate market has not only been the mainstay of whole economy [1], but also been an essential component of worldwide institutional investors' portfolios, because of its low correlation with other asset classes across national boundaries. As a major investment asset, real estate has a strong wealth effect on economic development [2]. Direct real estate investment (by purchasing actual physical property) was used to be the only choice for investors to engage in real

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estate investment. Nowadays, in the long run, the real estate markets of several major economies are increasingly correlated due to high liquidity of capital and financing. Such phenomenon induces negative effects on investors' portfolio returns. In contrast, the short run co-movements among various real estate markets are still insignificant [3]. In other words, diversified strategy is beneficial to direct real estate investment in the short-run. However, high costs of acquisition and management of property, together with illiquidity and stringent policies in different countries, make overseas direct investment difficult or even impossible for small investors.

Since 1960s, the emergence of Real Estate Investment Trusts (REITs) in the US provides an alternative investment tool for investors. It provides global investors an easy access to real estate markets. Since the securities are widely recognized among US investors, during the last two decades, over 20 countries in the world have established REIT regimes, while other countries have introduced REIT-like structures. The development of REITs has enlightened increasing investments in global real estate securities. Securitized property has been widely accepted as a class which deserves permanent allocation in multiclass portfolio [4] due to its dramatic growth and risk adjustment. However, investments and developments in real estate markets are very long-term in nature and possess two important characteristics, namely leverage and illiquidity. These two characteristics make most investors under-diversified, along with constraints of high transaction costs, holding constraints, or specific investment objectives [5].

Due to the growing importance of securitized property markets, vast studies have been conducted on this field. In particular, two methods are adopted by some previous studies. The first is the recursive model developed by Hansen and Johansen [6], and then applied by Rangvid [7] and Yunus [8] to investigate the cointegration relationship of stock markets and securitized property markets respectively. The second is the Fractionally Integrated Vector Error Correction Model (FIVECM) adopted by Liow and Yang [9]. This method is an extension of the Fractionally Integrated Error Correction Model (FIECM) (adopted by Serrano and Hoesli [10]) to multiple dimensions. FIECM and FIVECM have the advantage over Error Correction Model (ECM) and Vector Error Correction Model (VECM) in the way that FIECM and FIVECM incorporate a long history of past cointegration residuals, so they can incorporate long memory (long-range dependence) and short memory (short-range dependence) [9,10]. However, previous studies never applied both methods together. This study fills in this gap and contributes to the existing literature by establishing a new framework which combines recursive cointegration with FIVECM. Under our new combined framework, we estimate the fractional cointegration ranks and conduct the cointegration trace test based on a gradually enlarging of the length of the window. This technique can reflect the changes in cointegration dynamics during a period of time instead of a single result for the whole period. Therefore, we can depict the time-varying dynamics of the cointegration trace test and the estimated parameter of fractional cointegration. This can show how the cointegration pattern varies over time. We apply this new framework to investigate cointegration among 9 securitized real estate markets during the period 2000–2011. We divide the markets into three groups according to the continent each market belongs to: Asian, European and North American groups. By comparing the trends in the cointegration patterns of the three groups of markets over the period of time, we can see which group of markets is the source of cointegration, and which groups are the recipients.

The paper proceeds as follows: Section 2 review previous studies on related topics. Section 3 describes our methodology. Section 4 describes the data chosen. Section 5 displays the empirical results. Finally, we draw a conclusion in Section 6.

2. Literature review

Dynamics of property stocks in terms of return and volatility have evoked the scholars' interests recently. Bond et al. [11] used the latent factor model to examine contagion across real estate markets during the Asian crisis in 1997–98. They found existence of contagion among the markets. Wilson et al. [12] applied the method of structural time series to measure spillover effects across Asian property markets during the Asian crisis, and found a broad level of interdependence. Yunus and Swanson [13] examined long-run relationships and short-run causal linkages among the public property markets of the Asia-Pacific region and the US from January 2000 to March 2006. Long-term results indicated that the markets of Hong Kong and Japan provide the greater diversification benefits from the perspective of US investor, while short-run causality tests showed no significant lead–lag relationships between the property markets of the US and the Asia-Pacific region. Liow [14] examined the changes in both long- and short-run relations among the US, UK and eight Asian securitized real estate markets around the Asian crisis and during the most recent period. He found a stronger interdependence among Asian markets in both long- and short-run. Furthermore, this interdependence seemed to be on a rising trend recently. Gallo and Zhang [15] believed that global property markets are inter-regionally independent but intra-regionally cointegrated. In addition, they found that North America and Asia-Pacific regions still have some signs of diversification for some time in the future. Hui and Chen [16] applied the multivariate cumulative sum (CUSUM) test and the renormalized partial directed coherence (PDC) method to examine the structural causality change of securitized real estate indices of five Asian countries and regions. The result showed emergence of regional influence of the Chinese securitized real estate market on the causality structure of the five markets. Fry et al. [17] applied the coskewness test to examine contagion across global real estate markets during the Asian and US subprime crises. They found only little evidence of contagion during the US subprime crisis. Hui and Chan [18] applied the cokurtosis test to investigate contagion across equity and securitized real estate markets of Hong Kong, US and UK during the global financial crisis. They found that the cokurtosis test showed a highly significant evidence of contagion between the equity and real estate markets in both directions. In particular, the contagion between US's equity and real estate markets was the most significant.

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