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Dynamic information transfer in the United States housing and stock markets

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ABSTRACT

This study applies data from the housing market and stock market in the United States to evaluate the dynamic information transfer between the two markets. The results reveal that housing and stock prices do not have a long-term integral relationship, but exhibit a substantial short-term causal relationship. Therefore, the paper further evaluates the information transfer in the two markets. Results of this study show that the transmission mechanism of information among stock and real estate markets varies for different periods. In normal periods, the housing market transfers information to the stock market. However, during financial crisis, the stock market exhibits a net spillover of information. In addition, money supply affects information spillovers in the housing and stock markets, and the relationship between the two markets affects the treasury bill rate.

1. Introduction

This paper examines the spillover between the housing and stock markets in the United States to analyze the transmission mechanism of information between these two markets. For investors, the stock and real estate markets are both significant capital markets. Scholars have acknowledged the significance of this relationship, most especially since the 2007 subprime mortgage crisis, which caused both markets to plummet simultaneously. Since the crisis, academics have paid closer attention to information transmission processes between the two markets.

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Studies indicate that monetary policy or "hot money" may simultaneously influence the prices of both asset types (stock and real estate) (Sousa, 2010c; Guo & Huang, 2010)[1], whereas other studies contend that, over the long term, real estate markets primarily respond to economic activity (Adams & Fuss, 2010). Stock and real estate markets are likely to react to the same message because stocks are the "leading" indices of an economy. Additionally, the stock market leads the information response ahead of the real estate market. Furthermore, we can infer that real estate markets have a comparatively slower information response because of the questionable efficiency of real estate markets (Case & Shiller, 1989; Shiller, 1993, 2005). Thus, real estate markets influenced by changing stock markets must be a common phenomenon. However, studies indicate that the U.S. 2007 subprime mortgage crisis was triggered by imbalances in real estate markets, excessive subsidy policy (Shiller, 2009), and easing monetary policy (McDonald & Stokes, 2013). These factors are cited as causes of the housing market imbalance in the U.S. Therefore, in the case of subprime mortgage, the housing market is the lead market.

Based on the aforementioned discussion, the relationship between the stock and real estate markets during normal and crisis periods may differ. During normal periods, a relationship resulting from the wealth effect may exist between the two markets. During crisis periods, this relationship may increase in closeness because of risk transmissions, which is the contagion effect. In this study, overall changes in the relationship between the stock and real estate markets are identified by observing the dynamic information transmissions between them. Thus, this study uses data from the U.S. housing price indices for the entire nation from February 1991 to December 2011. For stock market indices, this paper employs the major U.S. stock price indices, S&P 500, to analyze the dynamic relationship between the stock and real estate markets.

Based on Diebold and Yilmaz (2012), this study estimates the vector autoregressive (VAR) model, and constructs spillover indices. Using the VAR results, the long-term relationship between the two markets can be understood. Additionally, the analysis of the direction and quantity of spillover index changes can be used to determine the information transmission mechanisms of the two markets in various periods.

Further, this study identifies the information transmissions between the two markets during normal periods. Results explain the risk transmission of both markets during periods of financial crisis. Additionally, this study includes data on the dot-com bubble. Thus, the subprime mortgage and the Lehman crises, which had a significant impact on the U.S. stock market, lead to the examination and explanation of how the relationship between stock and real estate markets in the U.S. changes during different types of crisis.

An indirect obstacle exists between the stock market and the housing market in the U.S., while segmentation appears between the housing and the stock prices (Liu, Hartzell, Greig, & Grissom, 1990). By using data from the Singaporean markets, Ong (1995) reports that no correlation exists between the stock and the housing markets. Green (2002) maintains that locality might influence the wealth effect between the stock market and the housing market in the U.S. and that the wealth effect exists only in areas with high housing prices, such as in California. However, Li and Wang (1995), Okunev and Wilson (1997), Okunev, Wilson, and Zurbruegg (2002), and Tsai, Lee, and Chiang (2012) report that the housing and stock markets are correlated, but possible structural change may exist in the correlation. Exploring the relationship between the two markets in different periods, this paper explains the dynamic relationship between the two markets more concisely through analysis. In addition, by evaluating the dynamic spillover index, the paper observes the factors behind the structural change in the relationship between the two markets.

The remainder of this paper is presented as follows. Section 2 reviews the related literature. Section 3 provides a brief explanation of the VAR framework and spillover indexes. Section 4 illustrates the data and reports estimation results. Section 5 describes two robust tests for validating the empirical research results. Section 6 summarizes the main conclusions.

[1] Sousa (2010c) investigated empirically the relation between monetary policy and asset markets for the euro area. Evidence shows that monetary policy not only has important asset price (stock prices and housing prices) effects, but also has very relevant wealth effects. Guo and Huang (2010) investigated the extent of the impact from hot money or speculative capital inflow on the fluctuations of China's real estate market and stock market.