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# Dynamic effects of financial stress on the U.S. real estate market performance



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## ABSTRACT

Based on the theoretical framework of financial amplification, this study investigates the dynamic effects of financial stress on the performance of the U.S. real estate market proxied by Real Estate Investment Trust (REIT) returns in the United States using vector autoregressive (VAR) analysis. Based on the analysis of monthly REIT returns and the monthly changes in the Federal Reserve Bank of St. Louis Financial Stress Index spanning 1994–2011, the response of returns on the CRSP Ziman REIT indices and sub-indices becomes negative in the first few months following the spike in financial stress. The Granger-causality tests indicate that financial stress causes the returns on the CRSP Ziman REIT indices and sub-indices to drop. The variance decomposition analyses show that financial stress is relatively more important than the overall stock market in forecasting the errors of the returns on the CRSP Ziman REIT indices and sub-indices.

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## 1. Introduction

The financial sector is the heart of market economies. Distress in the financial sector can negatively affect output, growth, asset prices, consumption and welfare. When the financial sector is stressful,

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real economic activities can slow down because businesses, consumers, and financial institutions are reluctant to invest, spend, and extend credit (Hakkio & Keeton, 2009). Moreover, the cost of capital can significantly increase when credit becomes scarce. Higher cost of capital is negatively associated with firms' investments and capital expenditures (Fernandez-Villaverde, Guerron-Quintana, Kuester, & Rubio-Ramirez, 2012; Gilchrist, Jae, Sim, & Zakrajsek, 2010). Likewise, the economy can contract when firms cease spending and delay or downsize their investment projects (Bernanke, 1983). Spending freezes and delaying or downsizing investment projects mean a higher unemployment rate in the economy.

Furthermore, asset prices and welfare can significantly deteriorate when the financial sector is depressed. In the financial amplification model, Jeanne and Korinek (2010) show a feedback loop between falling of asset prices, tightening borrowing constraints and declining consumption because borrowing is subject to constraints. Constraints depend on asset prices. This feedback loop is described as a financial accelerator, a mechanism by which declining net worth, tightening borrowing capacity, contracting economic activity and falling prices mutually reinforce each other. It is important to note that in normal times, market forces are stabilizing; however, during financial accelerator, market forces, in fact, are destabilizing (Jeanne & Korinek, 2010).

In light of the financial amplification model, the current study is set up to investigate the dynamic effects of financial stress on the performance of the U.S. real estate market, one of the most important sectors in the U.S. economy. This study uses the REIT market returns as a proxy for the real estate market as a whole. Hoesli and Oikarinen (2012) show that REIT performance is very similar to performance of the real estate market in the U.S., U.K., and Australian markets. MacKinnon and Zaman (2009) also show that REITs investment serves the same role as directly investing in the real estate market. Therefore, this study, in particular, analyzes how returns on the CRSP Ziman Real Estate Investment Trust (REIT) indices and sub-indices respond to financial stress shock. Two papers which are closely related to this paper are authored by Sum (2013) and Sum and Brown (2012). Sum (2013) examines how stock market risk premiums respond to financial stress. Sum and Brown (2012) explore how REIT returns respond to economic policy uncertainty shock.

Therefore, the major contribution of this study is to provide empirical evidence of the dynamic effects of financial stress on the U.S. real estate market. Since the effect of financial stress on the U.S. real estate has not been sufficiently studied, this study adds vital information to the current literature and contributes to the further understanding of the dynamic effects of financial stress on the U.S. real estate market. Finally the results of this study provide key implications for policy makers and practical applications for practitioners. Policy makers can consult the findings of this study to design key policies and regulations to ensure the soundness of the housing market. Likewise, the results of this study can serve as a guide for policy makers who are tasked to introduce a regulatory response to a disturbing housing market by making sure that the financial sector is healthy. The findings in this study solidify the vital role of the financial sector in the economy because when the financial sector is stressed, it can have a severe impact on the housing market which is one of the major drivers of the economy. Furthermore, investors and fund managers can rely on the findings of this study to optimize their investment strategies and hedge against their investment losses.

## 2. Method and data

The current study is set up to investigate the dynamic effects of financial stress on the performance of the U.S. real estate market. In particular, this study analyzes how the returns on the CRSP Ziman Real Estate Investment Trust (REIT) indices and sub-indices respond to the spike in financial stress. To achieve this purpose, the vector autoregressive (VAR) framework, a system of Eq. (1), is employed to examine the impulse response functions of the returns on the CRSP Ziman Real Estate Investment Trust (REIT) indices and sub-indices respond to financial stress shock. Based on the VAR analysis, the Granger-causality test is also performed to assess if financial stress causes the REIT returns to drop. The variance decomposition is also conducted to determine the relative importance of the returns on the overall stock market and financial stress in explaining returns on the CRSP Ziman REIT indices and sub-indices. REIT is entered first in the VAR model followed by CRSP and  $\Delta$ FS. As a proxy for stock market

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