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REITs' dynamics under structural change with unknown break points ☆

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Abstract

This paper considers dynamic behaviors of returns on real estate, equity markets, and related macroeconomic variables. Using monthly data measured over the period 1971–2004, we find a single structural break in a multivariate time series model of returns on REITs, returns on equities, industrial production, aggregate price inflation, default risk, the term spread, and short term interest rates. The break date is October 1980. A distinct difference in the contemporaneous causal structure generating these variables before and after the break is found. The paper shows that REITs play a more important role in the US economy after the 1980 break than before.

JEL Classifications: C22; G13

Keywords: Real estate investment trusts; Time series innovations; Directed acyclic graphs; Vector autoregression; S&P 500; Structural change with unknown break point

1. Introduction

Real Estate Investment Trusts (REITs) have played an important role in US real estate investment since their creation by Congress in the 1960s. REITs have supported the indi-

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rect investment or finance of the real estate sector with Mortgage-backed Securities (MBS).[1] They have become an important alternative investment tool for a wealth-building portfolio, compared to more traditional stock market investments. According to the National Association of Real Estate Investment Trusts (NAREIT), there are approximately 200 publicly traded REITs in the US today. Shares of these companies are traded on major stock exchanges, which set them apart from traditional real estate companies. The ratio of market capitalization in REITs to that in the S&P 500 was greater than 19% in 2003, compared to less than 10% in 1983.[2] As the market size of REITs increases, the positive relationship between returns on REITs and stock appears to be weakening. For example during the first three years of the 2000s, an inverse relationship existed between returns on REITs and returns on the S&P 500. REITs jumped 63% in value from the end of 1999 to the beginning of 2004, compared to a 23% drop in the S&P 500 index during the same period. The relationship between REITs, equity returns and other related variables will be investigated in this paper.

Several authors have studied the dynamics of the interface between financial markets and macroeconomic variables. Chen et al. (1986) find the relationship between financial markets and the macroeconomy is not unidirectional. McCue and Kling (1994) found that a shock to nominal interest rates has a significant negative effect on real estate returns using a vector autoregression (VAR) model fit over the period 1971–1991. However, they found shocks to other macroeconomic variables (output and investment) have little explanatory power on movements in real estate returns. Ewing and Payne (2005) studied the magnitude and persistence of unanticipated changes in four macroeconomic variables (monetary policy, real output, default risk premium, and inflation) on REITs returns using a generalized impulse response functions from a VAR (Koop et al., 1996, and Pesaran and Shin, 1998). Payne (2003) extends the Ewing and Payne (2005) model using three classifications of REITs: equity, mortgage, and hybrid types of REITs. The three types of REITs respond in a similar manner to shocks in macroeconomic variables, with the exception of inflation and default risk.

Gyourko and Keim (1992) demonstrate that the return on REITs is affected by the return of S&P 500 investments using a regression model. Peterson and Hsieh (1997) also find that equity REITs are significantly related to stock portfolios in terms of risk premiums and return rates using the five-factor model of Fama and French (1993). Okunev et al. (2000) support these studies by finding a unidirectional (Granger-type) causal relationship from stock market returns to real estate returns.

These studies use time series data. Several have been carried out assuming there has been no structural change. Others have considered the possibility of structural break(s) at an a priori known break point (Ewing and Payne, 2005, Payne, 2003, Chui et al., 2003, Okunev et al., 2000). Such breaks have not been found using tests for an unknown

[1] For details on REITs and their regulations see National Association of Real Estate Investment Trusts (2004). Briefly, a company which qualifies as a REIT is permitted to deduct dividends paid to its shareholders from its corporate taxable income. REITs are legally required to distribute at least 90% of their taxable income to shareholders annually in the form of dividends, thus differentiating REITs from other stock assets. Additionally, no more than 50% of the shares can be held by five or fewer individuals during the last half of each taxable year. Further, at least 75% of the total investment assets must be in real estate related entities.

[2] For the S&P 500, the market capitalization value is based on year end total indexed assets (Standard & Poors, "Annual Survey of S&P Indexed Asset", 2003). And for REITs, it is equity market capitalization outstanding (National Association of Real Estate Investment Trusts (2004) American Annual market capitalization).