International Review of Economics and Finance 42 (2016) 54–71

Contents lists available at ScienceDirect

International Review of Economics and Finance

journal homepage: www.elsevier.com/locate/iref

Facts or fates of investors' losses during crises? Evidence from REIT-stock volatility and tail dependence structures☆

MeiChi Huang [a], Chih-Chiang Wu [b,*], Shih-Min Liu [c], Chang-Che Wu [c]

[a] Department of Business Administration, National Taipei University, Taipei, Taiwan
[b] Discipline of Finance, College of Management, Yuan Ze University, Taoyuan, Taiwan
[c] College of Management, Yuan Ze University, Taoyuan, Taiwan

ARTICLE INFO

Article history:
Received 16 March 2015
Received in revised form 6 September 2015
Accepted 28 October 2015
Available online 4 November 2015

JEL classification:
C10
C58
G11

Keywords:
Tail dependence
REIT (real estate investment trust)
Copula
Range-based volatility
Asset bust

ABSTRACT

This study provides insight into diversification opportunities during the housing crisis by observing time-varying co-movements between real estate investment trust (REIT) and stock assets in 2000–2014. Out-of-sample forecasts, which are conducted according to the asset-allocation problem, reveal a swing in REIT-stock lower tail dependence during the global financial crisis. The lower-tail dependence exceeds 0.8, and thus implies stronger cross-asset linkages and fewer diversification opportunities in asset busts. These findings further suggest that the range-based volatility (asymmetric CARR) model is superior to the return-based (GJR-GARCH) framework, particularly as the global financial crisis prevails. Positive economic values of dynamic strategies are more evident during the crisis than pre- and post-crisis subperiods. The mortgage spread and VIX are informative in predicting REIT-stock tail dependences, and out-of-sample economic values improve as the mortgage and term spreads are considered.

1. Introduction

In recent years, households and investors in the US have suffered a housing crisis, which eventually evolved into a global financial disaster. Between 2007 and 2008, the real house price index[1] fell by approximately 20%, and the S&P500 index dropped by approximately 50%, from the level of 1533 to 773 (see Fig. 1). Subsequently, the crises led to huge wealth losses on a worldwide scale. Thus, the extreme events in both housing and financial markets have raised serious concern about diversification strategies, particularly during the periods of asset crises. Motivated by the fact of dramatic asset busts, growing empirical studies, such as Case, Yang, and Yildirim (2012); Friedrich and Bea (2009); Liow and Addae-Dapaah (2010), and Yang, Zhou, and Leung (2012), addressed diversification strategies across different asset markets. Specifically, Sa-Aadu, Shilling, and Tiwari

☆ This research is partially supported by a grant from the Ministry of Science and Technology of Taiwan.
* Corresponding author at: Discipline of Finance, College of Management, Yuan Ze University, 135 Yuan-Tung Road, Chungli, Taoyuan, Taiwan 320. Tel.: +886 3 4638800 3661; fax: +886 3 4354624.
E-mail address: chihchiang@saturn.yzu.edu.tw (C.-C. Wu).
[1] The real house price index is computed by 100*FMHPI/CPI. Freddie Mac House Price Index (FMHPI) is obtained from Freddie Mac (http://www.freddiemac.com/finance/fmhpi/); the CPI index, which is the deflator for the real housing price, comes from Bureau of Labor Statistics (BLS) (http://www.bls.gov/cpi/).

http://dx.doi.org/10.1016/j.iref.2015.10.046
1059-0560/

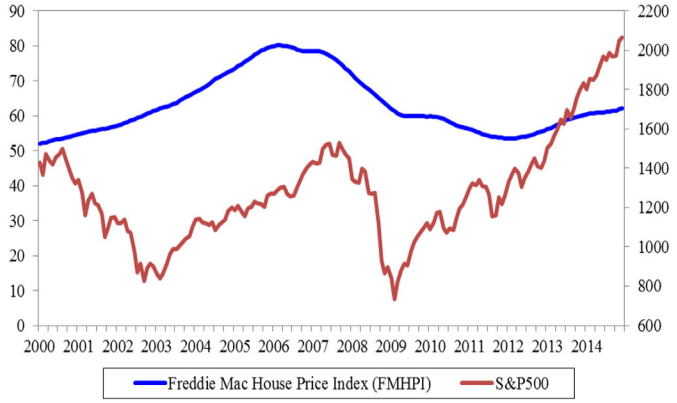

Fig. 1. House Price and Stock Price indexes. The right axis shows the S&P500 index and the left axis shows the real house price index. Both data range from 2000 to 2014.

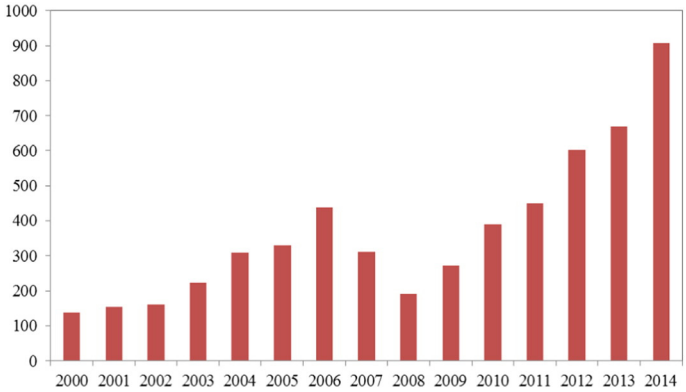

Fig. 2. Market Capitalization of U.S. REIT (billion) from 2000 to 2014.

(2010) used the REIT (real estate investment trust)[2] index to proxy for real-estate assets, and showed that appropriate asset allocation strategies can provide investors with diversification benefits over the business cycle. Also, Hoesli and Oikarinen (2012) suggested that REITs and direct real estate assets are good substitutes in long-term portfolios given their close linkages. In view of this, the present investigation aims to explore diversification opportunities from a fresh perspective across two main investment vehicles: the REIT asset which proxies for the real-estate market, and the stock asset which represents the financial market.

The REIT market allows investors with limited funds to invest in real estates and enjoy stable incomes. A number of recent studies have documented REIT markets (e.g., Basse et al., 2009; Cannon and Cole, 2010; Liow and Addae-Dapaah, 2010; Zhou and Anderson, 2012, 2013) since REIT assets play important roles in financial markets and its dynamics are closely associated with the economy. Generally, REITs deliver higher returns than bonds, but lower returns than stocks.[3] However, REIT prices display different dynamics, and have some advantages over stocks from the perspective of investment.[4] To some extent, REITs work as a good vehicle to diversify risks of various asset investments and macroeconomic aggregates. Due to momentum behaviors of asset price dynamics, an asset crisis is likely to spread to other asset markets. If a variety of markets suffer crises simultaneously, there is little room for investors to

[2] REITs originated in the US in 1960, and were added to the S&P500 indexes in 2001. In the last two decades, the REIT market had grown rapidly. According to data from the National Association of Real Estate Investment Trusts (NAREIT), the US outstanding market capitalization of REITs increased from $8.7 billion in 1990 to $438 billion in 2006, and then decreased to $192 billion in 2008. Its market capitalization declined by 56% during 2006-2008 due to the financial crisis (see Fig. 2), and returned to the level of $389 billion at the end of 2010. As of the end of 2014, REIT market capitalization reaches 900 billion.

[3] For instance, average monthly returns to REITs are 1.012%; those to bonds are 0.685%; and those to stocks are 1.052% (see Case et al. (2012)).

[4] REIT prices typically have a milder decline than stock prices when asset busts occur, as reported in the empirical literature, such as Ang and Bekaert (2002), Erb, Harvey, and Viskanta (1994); Longin and Solnik (2001), and Patton (2006). In addition, Liow and Addae-Dapaah (2010) suggested that idiosyncratic risks among REITs experience downward movements while those among stocks display upward ones during the period 1993–2008, which is commonly regarded as the new REIT era in the literature on REITs. Simpson, Ramchander, and Webb (2007) documented an asymmetric response of REIT returns to inflation: the relationship between dynamics of REITs and inflation is positive when inflation rises, but it is negative when inflation drops. Hence, REITs provide investors with diversification benefits against inflation.