A specialised volatility index for the new GICS sector - Real estate

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ABSTRACT

In this paper we show why a Real Estate VIX is needed. We develop a 30-day forward-looking real estate volatility index (REVIX), based on a state preference approach using US equity Real Estate Investment Trusts (REITs), for the new Real Estate Sector under the Global Industry Classification Standard (GICS). We show that REVIX is a very useful predictor of future REIT realized volatility. We further explore an economic application of REVIX and demonstrate that REVIX, similar to VIX, serves as an investor fear gauge for the real estate market.

1. Introduction

In this paper, we develop a real estate volatility index (REVIX) and explore its economic application. In so doing, our main goal is to establish the case for why financial markets need a Real Estate VIX, like REVIX. Market volatility is widely recognized as an important factor in investment and risk management. The premier benchmark for the stock market volatility is Chicago Board Options Exchange (CBOE) Volatility Index (VIX) launched in January 1993. VIX measures the market’s expectation of the next 30-day volatility implied by S & P 500 Index option prices.1 The Merrill Option Volatility Expectations (MOVE) index is usually deemed as the equivalent of the VIX for the US Treasury bond market. It was developed in April 1988 and is calculated as a weighted average implied volatility on 1-month Treasury options.2 In addition, applying the VIX methodology, CBOE has developed a number of volatility indexes for other markets including Crude Oil, Gold, Energy, and various currency and emerging markets.3 As one of the major investment asset classes, it is notable that real estate does not have its own market risk measure.

The need for a real estate volatility index is supported by the rapid expansion of the REIT industry over the last two decades. Fig. 1 shows the evolving pattern in the market capitalization of all US REITs. With a market capitalisation of $15.91 billion at the end of 1992, the REIT market grew to $161.94 billion at the end of 2002 and further to $603.42 billion by the end of 2012, representing an average growth of 185% per year.4 This speedy growth is not unreasonable. Investment into direct property assets requires a large outlay of funds and these assets generally lack liquidity. REITs offer an indirect avenue for average investors to gain exposure to the real estate market. More importantly, REITs possess economic importance because they offer considerable investment benefits including diversification, liquidity, continuous outperformance, high dividend yields, growth in real value and transparency. Today, almost all aspects of the economy are closely linked to REITs, for example, apartments, hospitals, hotels, industrial facilities, nursing homes, offices, shopping malls, storage centers, student housing and timberslands (NAREIT, 2013).5

Motivated by the dramatically increasing interest in REITs, S & P Dow Jones Indices and MSCI Inc. announced in November 2014 that a new Real Estate Sector, constituted primarily of equity REITs, will be added as the 11th sector under the Global Industry Classification Standard (GICS). We show that REITs have a cyclical link to real estate assets. Relatively recently, Hoesli and Oikarinen (2012) show that the contemporaneous correlation between REIT returns and direct real estate returns is low, however, their longer term link is useful.

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Standard (GICS) and this took effect on 1 September 2016. This first-time ever addition of a new sector in the GICS history reinforces the importance of real estate, as affirmed by S & P Dow Jones Indices and MSCI Inc. that:

“Real Estate is an important and growing part of major economies throughout the world. ... This is an example of our ongoing effort to ensure that GICS is reflective of today’s markets.”

The emergence of the new Real Estate Sector is very likely to influence REITs’ returns, risk and capital flows, among other immediate and far-reaching effects. Specifically, the headline-level Real Estate Sector should enhance investors’ understanding of REITs and facilitate generalist investors in identifying the unique characteristics of REITs’ operations, which may lead to higher REIT returns, and impact volatility and liquidity due to increased visibility. Increasing capital inflows into REITs can also be expected as REITs have been glaringly underweighted by fund managers. In this paper, we focus on the risk perspective and rely on equity REITs to develop a volatility index for this new sector. Consistent with the VIX and MOVE, the REVIX, computed on a daily basis, is a 30-day forward-looking volatility measure.

The VIX is computed based on the implied volatilities from option prices without the use of any particular model. As Whaley (2009) argues, to create similar volatility indexes to the VIX, the only important requirement is that the underlying index option market has deep and active trading across a broad range of exercise prices. However, given that the options on REIT index and exchange traded funds (ETFs) are not actively traded, the model-free implied volatility method in the spirit of the VIX is not feasible for the construction of REVIX. As such, we turn to the time-state preference approach developed by Arrow (1964) and Debreu (1959). As one of the most general frameworks in financial economics for contingent claims pricing under uncertainty, this approach offers distinctive advantages. First, our model, based on the state preference approach, possesses strong theoretical underpinnings. As such, it is intuitive and easy to implement. Put simply, the REVIX at time t is the sum of the expected real estate volatility in all the possible states at time t, where the expected real estate volatility in each state s is estimated as the state price (i.e. the price of a security that pays $1.00 at time t state s and zero otherwise) multiplied by the payoff (i.e. the expected real estate market volatility when the overall economy is at time t state s). Second, because our model incorporates all the possible market states/conditions, it captures the stochastic characteristic of volatility. While the VIX, MOVE and other CBOE volatility indexes are all weighted averages of implied volatility on certain options, such weighted averages might fail to reflect full stochastic nature of volatility.

Liu and O’Neill (2015) conduct a horse race between the VIX methodology and the state preference methodology. They apply the state preference approach to develop a state-price VIX for the stock market and find that the state-price VIX and the VIX are 99% correlated. Further, Liu and Faff (2017) propose a skew index, termed SIX, for S & P 500 returns based on the state preference approach and compare it with the CBOE SKEW Index. They conclude that SIX is more useful than SKEW as a complement to VIX. These results reinforce the suitability and effectiveness of using the state preference approach to create the REVIX, in particular, avoiding the thin trading problem of REIT index options.

Our results show that REVIX is a very useful predictor of REIT realized volatility, as reflected by an explanatory power (measured by the adjusted R-squared in the regression of REIT realized volatility on REVIX) of 71.66%. In comparison, the VIX has an explanatory power (measured by adjusted R-squared) of 58.89% on the next 30-day S & P 500 realized volatility.

We further examine the economic significance of REVIX by exploring its economic application. As the VIX is often referred to as the investor fear gauge for the stock market (Whaley, 2000; Whaley, 2009), we assess if REVIX plays a counterpart role to the VIX and serves as an investor fear gauge for the real estate market. Indeed, our analysis confirms that REVIX captures the asymmetry of real estate investors’ fear. That is, REVIX increases at a higher rate when the real estate market goes down than it decreases when the real estate market is bullish. This analysis provides evidence that REVIX contains important information regarding future REIT volatility and returns and, therefore, the value added by REVIX is economically significant.

The core contribution of our study to the finance literature is the creation of the first standardized ex-ante volatility measure for the real estate market, in particular, catering to the new Real Estate Sector under GICS. The existing real estate indexes such as the S & P
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