Habitat International 48 (2015) 38–45

Contents lists available at ScienceDirect

Habitat International

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

Testing calendar effects on global securitized real estate markets by Shiryaev-Zhou index

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ARTICLE INFO

Article history:
Received 23 October 2014
Received in revised form
2 February 2015
Accepted 13 March 2015
Available online 25 March 2015

Keywords:
Halloween effect
January effect
Shiryaev-Zhou index
Securitized real estate index
Trading strategy

ABSTRACT

Various calendar effects of stock markets were widely studied in the past. However, most of the previous studies use traditional methods such as regression. Furthermore, only a few of them studied Asian countries. This study investigates calendar effects, in particular, Halloween and January effects, on securitized real estate indices of eight economies (five of which are Asian economies): Hong Kong, China, Japan, Thailand, Malaysia, U.S., Canada, Germany, during the period 1996–2013, by a new approach: the Shiryaev-Zhou index. The results show that the Halloween effect is significant in Hong Kong and U.S.'s markets, but insignificant in other markets, while the January effect is significant in Hong Kong's market only. There are two possible reasons for these results. Firstly, the Halloween and January effects may weaken during turbulent periods. Secondly, the Halloween and January effects may have lost their predictive power since the publication of literature which made them famous.

1. Introduction

Many investors believe in the "buy-and-hold" strategy supported by the efficient market hypothesis (EMH) which ways that stock prices reflect all available information wholly at any time (Malkiel & Fama, 1970). Many studies supported the EMH (Malkiel & Fama, 1970; Malkiel, 2003, 2005; Barber & Odean, 2000). However, some other articles showed evidence contrary to EMH. For example, Hui, Wang, Yiu, and Wong (2013) found informed trading in Hong Kong and mainland-based real estate equities listed in Hong Kong. In particular, the equities of mainland-based developers with lower market values had a higher chance of informed trading. Informed trading provides evidence contrary to EMH. With the EMH in doubt, the "buy-and-hold" strategy may not work. In fact, a number of previous studies found monthly trends in stock price movement. They are called "calendar effects". The most common calendar effects are the Halloween and January effects.

The Halloween effect comes from the old saying "Sell in May and go away", which refers to the belief that stock market returns are significantly lower from May to October than from November to April. Such a dictum flies in the face of stock market logic for if there were such a pattern, investors would take advantage of it, causing prices to change and the pattern to disappear. In recent years there has been much work investigating this "puzzle", much of it initiated by Bouman and Jacobsen (2002), who found that from 1970 to 1998, the average returns during the period November–April were much greater than the average returns during the period May–October. They labeled this phenomenon the "Halloween effect". One possible reason for the Halloween effect is raised by Doeswijk (2008), who hypothesized that the Halloween effect is a consequence of an optimism cycle: investors look forward to the next year with overly optimistic expectations and as reality sets in during the course of spring, markets undergo a summer lull. Doeswijk (2008)'s findings support the optimism-cycle hypothesis.

The January effect (also known as the turn-of-the-year effect) is another famous seasonal pattern which states that financial security prices increase in January. This calendar effect was first discovered by Wachtel (1942), who found that since 1925, the high-yields stocks have outperformed Dow-Jones Industrial Average (DJIA) in January. Initial attempts to explain the January effect centered on the idea that individual investors, who disproportionately own small capitalization stocks (which, according to Keim (1983), provide more abnormal returns in January), sell stocks at the end of the year for tax reasons (perhaps to claim a capital loss) and buy them back in the New Year. Reinganum (1983) offered such tax-loss selling as a partial explanation of the January effect. Starks, Yong, and Zheng (2006) provided recent evidence supporting the

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http://dx.doi.org/10.1016/j.habitatint.2015.03.009
0197-3975/

tax-loss selling cause. However, Jones, Pearce, and Wilson (1987) dismissed tax-loss selling as a cause as there was no statistically significant changes in the effect after taxation was introduced. Apenbrink, Jones, and Lee (1991) drew a similar conclusion after examination of the returns of stocks in the Cowles Industrial Index before and after income tax was introduced in 1917. Other causes of the January effect that have been proffered include the risk of trading against informed traders (Seyhun, 1988); macroeconomic seasonality (Kramer, 1994); and the standardization of payments at the end of each month in the US (Ogden, 1990).

There were a lot of studies on Halloween/January effect and other calendar effects in the past. However, they produced mixed results. Furthermore, most of them work on the U.S. or European countries and the majority of them use traditional methods like linear regression (see Section 2 for details). However, Asian countries, which have been emerging rapidly in recent years, are often neglected (especially those developing countries like Thailand, Malaysia, etc.). In particular, little or nothing is known about Halloween or January effects on Asian real estate markets, which have been developing at a fast rate in recent years. This study tries to use an alternative approach, the Shiryaev-Zhou index, to examine the Halloween and January effects of eight securitized real estate markets. The advantage of this method is that the estimator of the Shiryaev-Zhou index gives rise to a trading strategy which generally outperforms the "buy-and-hold" strategy (Hui & Yam, 2014; Hui, Yam, Wright, & Chan, 2014). Therefore, when applying this method to examine the calendar effects, we can see in each month, for what percentage of time we should (or should not) hold the stock. This can help us to formulate a better trading strategy to increase profits. In this paper, we incorporated Shiryaev-Zhou index with logistic regression to test the significance of the Halloween and January effects on the eight securitized real estate indices we choose. We will also show that the trading strategy derived from the Shiryaev-Zhou outperforms the "buy-and-hold" strategy in general for the eight markets.

The objective of this paper is to investigate the Halloween and January effects on securitized real estate indices of eight economies during the period 1996–2013 by means of the Shiryaev-Zhou index. Five of the economies we choose are Asian economies: Hong Kong, China, Japan, Thailand and Malaysia. Hong Kong, China and Japan are east Asian economies of which the stock markets are better developed, while Thailand and Malaysia are southeast Asian countries whose stock markets are still developing. The remaining three countries are major economies in North America and Europe: U.S., Canada and Germany. Hence the sample is balanced and representative. The paper proceeds as follows: Section 2 reviews previous works on Halloween and January effects and Shiryaev-Zhou index. Section 3 displays the formula of the Shiryaev-Zhou index and its statistical estimation. Section 4 describes the data source. In Section 5, we derive a trading strategy from the Shiryaev-Zhou index and test the strategy on the eight securitized real estate indices chosen. Section 6 investigates the Halloween and January effects of the eight securitized real estate indices using the Shiryaev-Zhou index. Finally, we draw a conclusion in Section 7.

2. Literature review

2.1. Halloween effect

Previous studies on Halloween effect showed different results. For example, Sullivan, Timmermann, and White (2001) dismissed the Halloween effect and all other calendar effects as the result of the distortions of the statistical inference induced by data mining. Bouman and Jacobsen (2002) examined the Halloween effect of 37 countries during the period 1970–1998 (some countries have a shorter period of observation) by means of the usual regression technique. They found that the effect was present in 36 countries. Lucey and Whelan (2002) used a source of data not covered by Bouman and Jacobsen (2002), namely an index of capital returns on the Irish equity market, and found the Halloween effect to be statistically significant. Later, Maberly and Pierce (2004) demonstrated the importance of two outliers in Bouman and Jacobsen (2002) analysis: the 1987 crash (which started on October 19th) and the collapse of Long-Term Capital Management (LTCM's equity dropped from $2.3 billion to $600 million in the first three weeks of September). Replacing these two events with a dummy variable and analyzing the data from 1970 to 1998 again, the authors found the Halloween effect to be statistically insignificant. Using a larger data set of US stock market returns from 1926 to 2005, Jacobsen and Visaltanachoti (2009) showed that more than two-thirds of all sectors and industries have a statistically significant Halloween effect. They also noted that the effect was almost absent in sectors related to consumer consumption but strong in production sectors. Brounen and Ben-Hamo (2009) analyzed the price dynamics of international property shares of the ten most prominent markets in the world and South Africa. They found that the Sell in May effect (i.e. the Halloween effect) was both economically and statistically significant in five countries. Lean (2011) examined the existence of Halloween effect in the stock market of Malaysia, China, India, Japan, Hong Kong and Singapore. The results revealed that the effect was only found in Malaysia and Singapore with the OLS model. However, with the conditional variance model, China, India and Japan also showed evidence of the Halloween effect. Andrade, Chhaochharia, and Fuerst (2012) performed an out-of-sample test of the Halloween effect. They found that on average, stock returns were about 10% higher in November to April semesters than in May to October semesters. Hence "Sell in May and Go Away" remained a good advice. Hui, Wright, and Yam (2014) investigated calendar effects of 27 securitized real estate indices from 20 countries. They found that if linear regression was used, statistically significant calendar anomalies persisted. However, when they applied White's Reality Check (White, 2000) and Hansen's Superior Predictive Ability (Hansen, 2005) tests, the results showed that no calendar rule significantly outperformed the "buy-and-hold" strategy. In particular, only two securitized real estate indices showed a significant sell-in-May anomaly. Hence there is little evidence of the Halloween effect.

2.2. January effect

Previous works on January effect also produced mixed results. Keim (1983) noted that the relation between abnormal returns and size of the company was always negative and more pronounced in January than in any other months. Agrawal and Tandon (1994) tested for the seasonal patterns in the stock markets of 18 countries and found the January returns to be large in most countries. Cheung and Coutts (1999) found no evidence of January effect or any other monthly seasonality on Hong Kong's Hang Seng Index (HSI). Fountas and Segredakis (2002) tested for the January effect using monthly stock returns in 18 emerging stock markets for the period 1987–1995. They found very little evidence in favor of the January effect. Gu (2003) showed that The January effect exhibited a declining trend for Dow Jones Industrial Average (DJIA), S&P 500 and the Russell indices. The January effect was even disappearing for the Russell indices. Hansen, Lunde, and Nason (2005) derived a test for calendar specific anomalies and concluded that the January effect exhibited the largest seasonal anomaly. Hardin, Liano and Huang (2005) investigated calendar anomalies in REITs. They found that the January effect is statistically insignificant for the REIT value-weighted index, but significant for the REIT equal-weighted