IDIOSYNCRATIC RISK AND REAL ESTATE SECURITIES' RETURN

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Abstract

Though the specific characteristics of real estate play important role on the investment return, many investors pays less attention on the details of real estate securities. The introduction of real estate securities permits cash flow return of real estate to be repacked and sold to investors in small units, which paves the way for investors to diversify most idiosyncratic risk with no difficulty. Theoretically, investors should diversify most diversifiable risk away because only the volatility of market is deemed to be an important factor affecting the securities' return. However, this paper finds that the systematic risk does not play most part in setting real estate securities' return. Adopting capm test, this study discovers that investors still have to carefully pay attention on specific characteristics of each real estate security they plan to invest.

Keywords: Real estate securities, property fund, reit, idiosyncratic risk, systematic risk, diversification, capm,

1. Generalities of the study

1.1 Introduction

The real estate securities investment is often claimed to be a good alternative to direct real estate investment for its superior liquidity provided from the secondary market trading. The allowance for investment in small amount of money also lets investors be able to diversify the idiosyncratic, so-called unsystematic, risk easily. However, it is still doubtful whether the systematic risk of real estate securities is the main risk to be worried or not and whether the degree of market development is involved in this doubt.

Capital asset pricing model (capm), a well-known financial theory developed independently by lintner (1965a, 1965b); mossin (1966); sharpe (1964), explains that an investor's required return includes risk-free rate and risk premium, the compensation for the systematic risk of the invested asset. No compensation should be given to the idiosyncratic risk because this risk could be easily diversified by just adding more assets in the investor's portfolio.

This study utilize capm model to analyze the composite of the real estate security portfolio's risk premium, which is the difference between the portfolio's return and risk-free rate, to identify the portion reflecting the real estate securities' systematic risk and the part reflecting the securities' idiosyncratic risk in both thailand's exchange and singapore' exchange during 2004 to 2014.

The result of this study indicated that the systematic risk is an important factor in determining the return of the real estate securities as stated in capm, yet the specific characteristics of real estate securities are important factors that affect their return in both countries.

1.2 Purpose of Study

The objectives of this study is to examine systematic risk premium and idiosyncratic risk premium of real estate securities and to compare the involvement of these risks in thailand and singapore's stock market.

The findings of the study will provide evidence to support the academic study on real estate securities in the areas concerning the application of capital asset pricing model in determining the real estate securities' return and the efficiency market in real estate securities. Besides, the findings will suggest whether investors should have more focus on the specific characteristics of each real estate security in the selection process or not.

The time-series regression model, based on standard capm introduced by lintner (1965a, 1965b); mossin (1966); sharpe (1964) is used to identify the risk premium for systematic risk and the unexplained premium is presumed to be the risk premium for the idiosyncratic risk.

1.3 Scope And Limitation of Study

This paper only focuses on data of real estate securities in thailand and singapore during 2004 to 2014. Limitations of this study are firstly, the newness of the real estate securities market allows this research to obtain a data length of only 11 years for the analysis. Consequently, the result of the study might not entirely reflect the long-run equilibrium of real estate securities market. Secondly, the subprime crisis in u.s. During 2008 to 2009, which is related to the skimming pricing in real estate, might cause temporary disequilibrium of the real estate securities markets in thailand and singapore owning to market integration and distort the return of real estate securities during the crisis period.

2. Review of Related Literature

Modern portfolio theory decomposes the components of risk into non-diversifiable portion known as systematic/market risk and diversifiable portion called unsystematic/idiosyncratic risk. The renowned capital asset pricing model (capm) theory, which is the general equilibrium model that exhibits relationship of asset returns in the capital market, states that only systematic risk should be rewarded or priced because the idiosyncratic risk can be eliminated completely through diversification (black, 1972; lintner, 1965a, 1965b; mossin, 1966; sharpe, 1964). However, the capm model was derived from Several underlying assumptions such as no transaction cost, complete information, and etc. Merton (1987) developed a model of capital market equilibrium based on a more practical underlying assumption of incomplete information. Consequently, he argued that investors should be rewarded for holding under-diversified portfolios. In other words, the idiosyncratic risk should be priced since investors are often unable to completely diversify the idiosyncratic risk owing to incomplete information. In practice, both diversification and information, which is imperative for diversification decision, are costly e.g. Process of diversification would incur higher transaction costs. Therefore, the idiosyncratic risk is relevant in asset pricing in the absence of complete information and under-diversified portfolios of investors are generally attributed to either constraints or choice (malkiel & xu, 2006). Principal constraints that restrain small investors from holding well-diversified portfolios are budget, information, time, and skill.

A number of empirical papers have examined a proportion of the idiosyncratic risk in comparison to total volatility of different assets and tested whether it is actually priced. The idiosyncratic risk and returns of real estate and real estate securities are of interest to a wide range of researchers; see for example, brueggeman, chen, and thibodeau (1984); hartzell, heckman, and miles (1987); ibbotson and siegel (1984). A proportion of idiosyncratic risk to total risk was investigated by capozza and schwann (1990). The empirical findings indicated that the idiosyncratic risk is a highly significant determinant of house prices. For real estate securities, real estate factors have been identified and confirmed to be significant variables in explaining return of reits, (mei & lee, 1994). Recently, ooi, wang, and webb (2009) asserted that real estate securities are more exposed to the idiosyncratic risk, i.e. Firm- specific risk, owing to the intrinsically localized and segmented nature of the underlying assets i.e. Real estate. Real estate space market is highly segmented due to geographical location and property type (geltner, miller, clayton, & eichholtz, 2007). In sharp contrast, chan, hendershott, and sanders (1990) adopted multifactor arbitrage pricing theory (apt) and capm to analyse returns on equally-weighted portfolio of 23 equity reits during 1973-1987 and revealed that reits are less risky than common stocks.

The empirical evidences of many studies indicated that systematic risk, which is measured by beta in the capm model, does not significantly explain the volatility of real estate securities' returns, (ooi et al., 2009). Conversely, the idiosyncratic risk significantly affects return and volatility of reits. In addition, the role of unsystematic/diversifiable risk in the pricing of real estate securities has been growing (anderson, clayton, mackinnon, & sharma, 2005; clayton & mackinnon, 2003). Volatility of reit returns was decomposed into stock, bond, and real estate factor in clayton and mackinnon (2003). Besides, variance of residuals from the regression estimation was taken as the idiosyncratic risk. The findings clearly exhibited the escalation of idiosyncratic variance of reits during 1979 – 1998. However, the study was undertaken only at the index level, not at the firm level. Additionally, a significantly positive relationship between the idiosyncratic risk and the degree of corporate focus was discovered in boer, brounen, and op't veld (2005).

At the firm level, ooi et al. (2009) studied the idiosyncratic risk relative to the fama and french (1993) three factors (i.e. Size, value, and financial leverage) of 149 reits which were publicly and actively traded on the us capital markets during 1990 to 2005. The idiosyncratic risk was represented by the variance of the residuals in the regression of fama and french three-factor model (anderson et al., 2005). The empirical results revealed that

Size of reits significantly influenced the level of idiosyncratic risk i.e. Smaller reits possessed higher proportion of the idiosyncratic risk than larger reits. Significantly, the level of the idiosyncratic risk evidently behaved in a cyclical pattern, which implies that intensity of diversification should vary at different state of economy. Furthermore, the findings exhibited that the idiosyncratic risk, on average, accounted for 78.3% of total volatility of reits' returns.

Peungchuer and buranasiri (2014) studied the significance of property funds' characteristics in thai capital market during 2003 to 2013. The dataset of this paper comprised both cross-sectional and time series elements (so-called a panel of data); therefore, panel technique was utilised several fund-specific variables, i.e. Level of diversification, fund size, fund age, investors' knowledge on the funds' invested properties, and type of property right invested by fund, were examined and tested. Fund size is the only characteristic of property fund that was statistically identified to be significant in determining total return of property funds.

Much has been researched and documented regarding the significance and proportion of the idiosyncratic risk of real estate and real estate securities in the well- established market. Nevertheless, it appears that there are not enough studies, in turn, are not enough empirical evidences to substantiate the contention concerning the importance of the idiosyncratic risk, so-called firm-specific risk, of real estate securities in the emerging markets.

3. Research data and methodology

3.1 Research Data

This empirical study attempts to examine the significance of the idiosyncratic risk in determining returns on real estate securities and its proportion in relation to total risk of real estate securities' returns. All publicly listed "real estate investment trusts (reits)" that are actively traded on the two major exchanges of asean economic community (aec), 1) stock exchange of thailand (set) representing emerging market and 2) singapore exchange (sgx) representing established market, will be explored. However, the first reit of thai capital market has just been launched for trading on set in late 2014. Therefore, the unit of analysis

For set will be "property fund" instead, as it has been issued and traded on set since late 2003.

The number of real estate security in the sample is not constant throughout the period of study; however, it consists of 52 listed property funds in the set and 39 listed reits in the sgx at the end of the study period. All time-series data utilized in this research paper, apart from the portfolios' returns, are retrieved from thomson reuters – datastream database. Two equally-weighted portfolios are constructed, one comprises all property funds in the set and the other one comprises all reits in the sgx. The sample period under examination spans from 2004 – 2014 on a monthly basis. However, the length of data of each real estate security is varied, as the funds/reits are setup at different point of time. The following table describes data employed for this paper:

Table 1
Description of data

Data	description
Rpf	total returns on equally-weighted portfolio of all property funds in the set
Rtb-th	treasury bill rates of thailand as a proxy of risk-free rate in thailand
Rm-th	total returns on the set as a proxy of market returns in thai capital market
Rreit	total returns on equally-weighted portfolio of all reits in the sgx
Rtb-sg	treasury bill rates of singapore as a proxy of risk-free rate in singapore
Rm-sg	total returns of the sgx as a proxy of market returns in Singapore

3.2 Methodology

In order to derive monthly total returns of each real estate security and capital market, total return indices of each real estate security and exchange are retrieved from datastream. Then the natural logarithm is applied to the indices, the difference of natural logarithm, ln[indxt / indxt-1], is computed to represent total returns of real estate securities and exchanges. The merit of taking the first difference of logarithm is that it normally converts the indices into stationary time-series (brooks, 2014). The price and total return indices are generally nonstationary; thus, they should not be used directly for regression Estimation. Subsequently, two portfolios of real estate security, 1) property funds and 2) reits, are formed based on an equal weight basis.

Adopting previous empirical works which attempted to examine and test the idiosyncratic risk of real estate and real estate security whether it is important in determining total returns of real estate security, the time-series

regression of a standard capm model is employed, see for example; anderson et al. (2005); black, jensen, and scholes (1972); ooi et al. (2009). The econometrical model is as follows:

$Rit - rft = \alpha i + \beta i(rmt - rft) + \varepsilon it$

Where rit is the total return on real estate security portfolio
Rft is the risk-free rate of return
Rmt is the market returns
Bi is the beta on portfolio of real estate security
Eit is the regression residuals

The excess returns on the equally-weighted portfolio of real estate security are regressed on the standard capm model (black et al., 1972). The beta, βi, is the market risk component of equally-weighted portfolios. Subsequently, the standard deviation of residuals term, εit, from the regression estimation of a standard capm model represents a common gauge of the idiosyncratic risk whilst the standard deviation of the portfolio's excess returns represents total risk (black et al., 1972; ooi et al., 2009). Therefore, the Relative contribution of the idiosyncratic risk to total risk is [σ 2 / σ 2], the proportion of the E I Volatility of regression residuals in relation to total volatility of portfolio's excess returns (anderson et al., 2005).

4. Empirical Result

Given the highly segmented and localized character of real estate space market (geltner et al., 2007), it is not unexpected that the findings indicate high proportion of the idiosyncratic risk component in both portfolios. Practically, the idiosyncratic risk is measured by standard deviation of the regression residuals and total risk is measured by standard deviation of the portfolio's excess return. Table 2 shows risk components of real estate security portfolio. Total risk of reit portfolio is 6.43 whereas the total risk of property fund

Portfolio is only 2.45, this implies that property funds listed in the set is a safer investment vehicle than reits listed in the sgx. It is in line with the estimated beta, βi, the beta of reit portfolio (sgx) is 0.95 whilst the beta of property fund portfolio (set) is only 0.24. Higher beta means higher systematic risk (elton, gruber, brown, & goetzmann, 2009). Due to less- than-1 beta, a conclusion can be drawn that investing in property funds in thailand is, on average, conservative.

Table 2
Risk components of real estate security portfolio

Risk component	equally–weighted property Fund portfolio – set	equally–weighted Reit portfolio – sgx
Estimated beta (βi)	0.24	0.95
Idiosyncratic risk (s.d. Of regression residuals)	1.820247	3.454167
Total risk (s.d. Of portfolio's excess return)	2.446298	6.425866

For the idiosyncratic risk, this study finds that reit portfolio has higher idiosyncratic risk than property fund portfolio. However, it is not appropriate to draw conclusion solely from the absolute value of the idiosyncratic risk. Since total risk consists of idiosyncratic risk component and systematic risk component, total risk decomposition is applied to derive a proportion of the idiosyncratic risk in relation to total risk. The results reveal that the proportion of the idiosyncratic risk in property fund portfolio is 74.41% while it is only 53.75% in the reit portfolio. The evidence tentatively indicates that the importance of the idiosyncratic risk (firm-specific risk) in determining real estate security's return in emerging market like thailand is, to a great extent, more than more-developed market like singapore. Figure 1 illustrates the proportion of idiosyncratic risk and systematic risk in thailand and singapore during the past decade, 2004-2014.

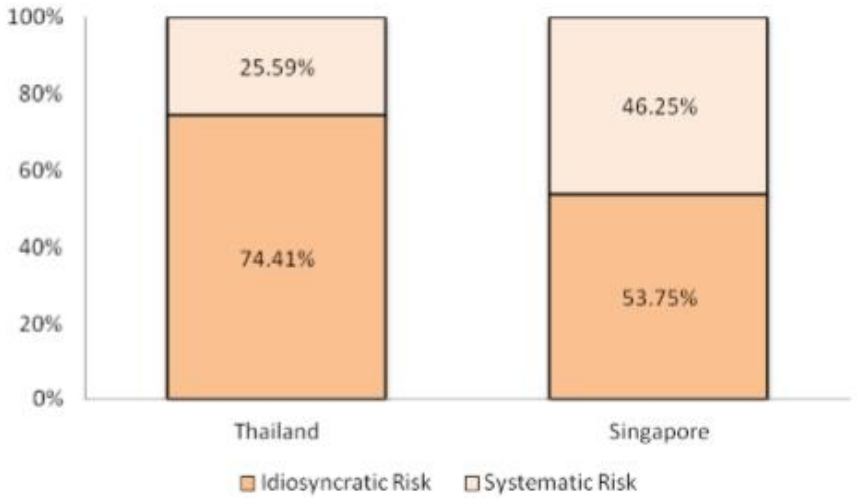

Figure 1: proportion of idiosyncratic risk of real estate security in thailand and singapore during 2004 to 2014

5. Concluding Remarks

The regression from capm in this study shows that the idiosyncratic risk plays an important role in the return of real estate securities in both thailand and singapore and the higher level of the idiosyncratic risk of real estate securities in thailand might be due to the lower-developed level of the exchange. Additionally, the return of real estate securities in thailand is humbly tied to the market's return; however, the return of real estate securities in singapore is highly tied to the market's return.

In overall, investors who invest in real estate securities are not well-diversified investors (xu & malkiel, 2003). Consequently, the findings suggest that idiosyncratic risk is an important determinant of the real estate securities' return. Therefore, those interested to add real estate securities in their portfolio should pay attention on the specific characteristics of the real estate securities beyond the market condition.

Further studies should be done on the same aspects but in many different countries to find out whether the idiosyncratic risk is a common nature in real estate securities or not. Additionally, the level of the idiosyncratic risk and its proportion in relation to total risk should be explored at different state of economy, i.e. Time path analysis (ooi et al., 2009). Comprehension of the trend or movement pattern of the idiosyncratic risk has profound

Implication for diversification of an investment in real estate securities. Furthermore, the further study should also be undertaken to discover the specific characteristics of real estate securities which contribute to the idiosyncratic risk in different countries., e.g. Size, value, leverage (fama & french, 1993; peungchuer & buranasiri, 2014).

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