THE PERFORMANCE OF THAI-REITs IN A MIXED-ASSET PORTFOLIO

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ABSTRACT

This study examines the development of REITs in Thailand over October 2003 – September 2010, analyses their risk and return characteristics, investigates the dynamic correlations between REITs and other investment vehicles and determines the diversification potential of Thai-REITs in a mixed-asset portfolio. Sub-period analysis is also conducted to analyse the impact of the GFC to the performance of Thai-REITs and correlations with other asset classes. As there was no REIT index available for the Thai listed REITs, a value-weighted REITs index was constructed to represent listed REITs on the Stock Exchange of Thailand. The results show that pre-GFC and during the GFC, Thai-REITs only played a minor role in the mixed-asset portfolio at low risk levels due to their poor risk-adjusted performance. However, the period post-GFC saw Thai-REITs gaining a significant position in the mixed-asset portfolio as the inclusion of Thai-REITs reduced risk and enhanced the return of the portfolio. In addition, the study also suggests that Thai-REITs offer a low-risk investment option and a better portfolio optimizer than property companies for shares investors.

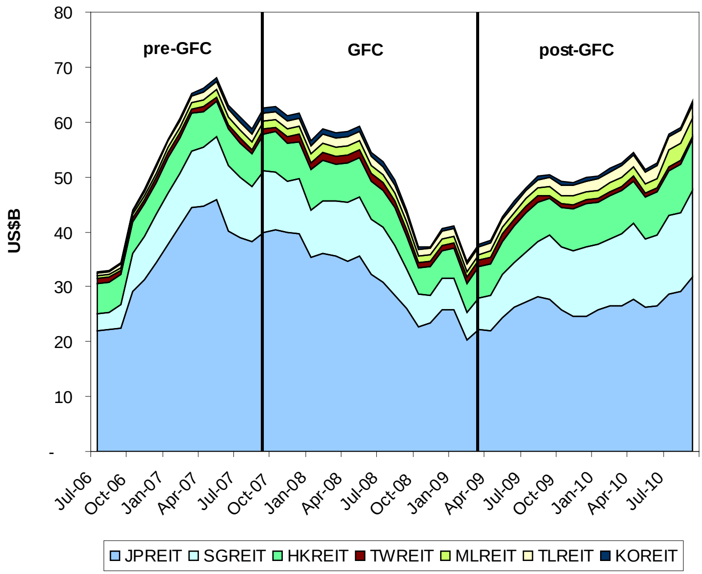
Keywords: Thailand, Thai-REITs, development, performance, investment, mixed-asset portfolio.

INTRODUCTION

Since its introduction in the 1960s from the United States, real estate investment trusts (REITs) have become an important investment vehicle around the world. In Asia, the first REIT market was established in Japan in 2001, followed by Singapore and Hong Kong. As of June 2010, there were 120 REITs listed across Japan, Singapore, Hong Kong, Malaysia, Thailand, Taiwan and South Korea with a total market capitalisation of approximately US$64 billion, equalling 12% of the global REIT market capitalisation (CBRE 2010; Macquarie 2010). Figure 1 shows the development of Asian REITs over July 2006 – October 2010 in terms of total market capitalisation. In 2007, Asian REITs were hit hard by the global financial crisis (GFC), with total market value dipping by more than 50%. However, REIT markets around Asia have been rebounding strongly since March 2009, increasing to their previous levels before the crisis.

In Thailand, the concept of real estate investment trusts was developed in 2002, as a recovery vehicle for the property market devastated by the 1997 financial crisis. The Thai version of a REIT is known in the country as Listed Property Funds for Public Offering (PFPO), which is considered to be much stricter than REIT regimes overseas. The first Thai-REIT, UOB Apartment Property I Leasehold, was listed on the Stock Exchange of Thailand (SET) in 2003. As of October 2010, there were 27 listed Thai-REITs with a total market capitalisation of approximately US$2.5 billion. With many positive modifications in the regulatory framework to be implemented and moved towards international standards, the REIT market in Thailand offers great opportunities as well as challenges to institutional and global investors.

Figure 1: Market capitalisation growth of REITs in Asia: July 2006 – October 2010



Source: Author's compilation from DataStream

Given the significance of REITs as an effective indirect real estate investment vehicle, it is important to understand the risk and return characteristics of REITs as well as their dynamic relationships with other asset classes. There has been extensive research on the performance of REITs and their role in the mixed-asset portfolio. However, most of the research primarily focused on developed markets such as the US, UK and

Australia. In Asia, a number of research papers on REITs have been carried out in recent years. Studies on performance and dynamics of Asian REITs were conducted on both a regional (Chiang et al. 2008; Ooi et al. 2006) and local context in major markets such as Japan (Kutsunaa et al. 2008), Singapore (Ooi 2009; Quek and Ong 2008; Sing and Ling 2003), Hong Kong (Newell et al. 2010), Malaysia (Lee and Ting 2009; Newell et al. 2002) and Taiwan (Lin 2007). In the wake of the recent global financial crisis, some research has also been done on the impact of the GFC on REIT performance (Kim 2009; Newell and Peng 2009).

Despite a number of studies carried out on Asian REITs, no empirical research has been conducted to examine the role and performance of real estate investment trusts in Thailand. Most of previous research on Thailand revolved around the direct property market, the impact of the 1997 financial crisis (Pholphirul and Rukumnuaykit 2009; Vanichvattana 2007) and Thai property securities (Liow and Adair 2009; Liow and Sim 2006; Newell et al. 2005; Newell et al. 2009). Given the potential of Thai-REITs within the Asia REIT context, this research will be the first attempt to study the performance and role of Thai-REITs in a mixed-asset portfolio.

This study examines the development of REITs in Thailand over October 2003 – September 2010, analyses their risk and return characteristics, investigates the dynamic correlations between REITs and other investment vehicles and determines the diversification potential of Thai-REITs in a mixed-asset portfolio. Sub-period analysis is also carried to analyse the impact of the GFC to the performance of Thai-REITs and correlations with other asset classes. The remainder of this paper is structured as follows. Section 2 discusses the development of Thai-REITs, their background, regulatory structure and future outlook. Section 3 presents the data and methodology of this research. Section 4 reports the performance of Thai-REITs in comparison to other asset classes. Section 5 analyses the impact of the GFC to the performance of Thai-REITs in a mixed-asset portfolio. Section 6 gives the conclusions, with strategic implications for the ongoing development of Thai-REITs.

DEVELOPMENT OF REAL ESTATE INVESTMENT TRUSTS IN THAILAND

Thailand's Listed Property Funds for Public Offering (PFPO), also referred to as Thai-REITs, were introduced in 2002 following the 1997 financial crisis. Although PFPO was initially established as a resemblance of the REIT structures in the US and Australia, there are some distinctive differences between them. Table 1 presents details of the current PFPO regulatory structure and characteristics. The PFPO code is considered to be more rigid than other REIT regulations overseas, due to the fact that there are many restrictions regarding geography, leverage and institutional holding. Thai-REITs' investment is restricted to properties in Thailand only. In addition, Thai-

REITs cannot borrow more than 10% of their net asset values (NAV). These restrictions certainly have some impacts on Thai-REIT performance, as its growth and ability to acquire additional assets were constrained. On the other hand, these restrictions would help reduce exposure to additional risks, such as currency fluctuation, geographical and interest rate risks. There is also a 33% restriction on holding of the trust certificates by the same person. This is the major obstacle for acquisition of institution investors in Thai-REITs. Other Thai-REIT characteristics are similar to REITs overseas such as no foreign ownership restriction, 90% net profit distribution and tax transparency. The regulatory body is the Securities and Exchange Commission of Thailand (TSEC).

Table 1: Regulatory structure and characteristics of Thai-REIT regime

Structure:	Closed-end mutual fund
Management:	External
Geographical restrictions:	Thailand only
Borrowing restrictions:	Not more than 10% of NAV
Holding restrictions:	Persons in the same group can hold a maximum of 33% of the total trust certificates sold
Investment restrictions:	Must invest at least 75% of NAV in property.
Development restrictions:	May acquire properties over 80% completed but prohibited to invest in dormant land (for PFPO)
Foreign ownership restrictions:	No foreign ownership restriction. However, there are foreign restrictions in relation to land ownership (49%), land trading businesses, hotels and condominium projects
Distribution:	At least 90% of net profits
Stamp duty:	Applies at varying rates to various REIT-related documentation
Tax transparency:	Yes. REITs are not subjected to Thai Income Tax
Withholding tax:	Not legislatively imposed
Regulatory framework:	Trust for Transaction in Capital Market Act B.E. 2550 (2007)
Regulatory body:	Securities and Exchange Commission of Thailand (TSEC)

Sources: Author’s compilation from CBRE (2010), TRUST (2010)

On 11 October 2010, the Securities and Exchange Commission of Thailand (SEC) announced that it has approved the new REIT regulatory framework, following international practices. The aim of this new legislation is to provide greater flexibility for real estate investment trusts, as compared to the current PFPO code. According to Boonsong and Charoenwongse (2010), there will be some major changes in the regulations which make Thai-REITs more attractive than the current PFPO regime. There will be less restriction on investment activities, as Thai-REITs can invest in any type of real property that can generate rental revenue, except for real property involving immoral or illegal businesses. More importantly, the maximum total borrowing of Thai-REITs will be raised to 50% of NAV, as opposed to 10% in the case of PFPO. This will give Thai-REITs more flexibility to acquire additional properties and to optimise their capital structure. The limitation on holding will also be increased to a maximum of 50% of the total trust certificates sold. With less holding restrictions, Thai-REITs are expected to be more attractive to institutional investors. These changes have been well received by property trust managers as well as institutional investors. However, as Thai-REITs become more exposed to borrowing funds, there would be a major shift in the risk structure of Thai-REITs in the future.

Since the first Thai-REIT (UOB Apartment Property I Leasehold) was listed in October 2003 on the Stock Exchange of Thailand (SET), there have been 26 additional REITs established. The majority of Thai-REITs were established after 2007, when the Trust for Transaction in Capital Market Act took effect. This reflects the important role of regulatory factors to the development of Thai-REITs. As of October 2010, total market capitalisation of Thai-REITs amounted to approximately US$2.5 billion, accounting for 3.9% of total REIT capitalisation in Asia (Table 2). Whilst the Asian REIT market is still largely dominated by Japan (#1), Singapore (#2) and Hong Kong (#3), together accounting for almost 90% of the total market value, Malaysia (#4) and Thailand (#5) are increasing their roles, with many positive improvements in their regulatory frameworks in recent years.

Table 2: Significance of Thai-REITs in Asia: October 2010

Country	Number of REITS	Market cap (US$B)	Percentage of Asia market
Developed			
Japan	37	$31.7	49.6%
Singapore	24	$15.9	24.9%
Hong Kong	6	$9.3	14.6%
Developing			
Malaysia	14	$3.3	5.1%
Thailand	27	$2.5	3.9%
Taiwan	8	$0.5	0.8%
South Korea	7	$0.7	1.0%
Total Asia	**123**	**$63.8**	

Source: Author’s compilation from DataStream

Table 3 gives more details on the profile of Thai-REITs as of October 2010. Thai-REITs however are characterized by their small size, low property exposure and single sector focus due to many restrictions on borrowing and asset acquisition. As of October 2010, the average size of Thai-REITs was around US$89 million, significantly smaller than the average size of REITs in the developed Asian REIT markets, e.g. Japan, Hong Kong and Singapore, where there are fewer restrictions. Most of Thai-REITs held less than three properties and all of them are geographically restricted in Thailand only. This low real estate exposure and geographical concentration would limit Thai-REITs from achieving sufficient portfolio diversification of their real estate holdings.

Table 3: Profile of Thai-REITs: October 2010

REIT name	Base date	M cap (US$M)	No. of properties	Property sectors
CPN Retail growth leasehold property fund	Aug-05	577	3	Retail
Samui airport property fund (leasehold)	Nov-06	292	1	Logistics
Ticon property fund	May-05	271	174	Industrial
Quality houses property fund	Dec-06	240	3	Office
Future park property fund	Dec-06	181	1	Retail
Centara hotels and resorts leasehold property fund	Oct-08	88	1	Hotel
Major cineplex lifestyle fund	Jul-07	74	2	Retail
Millionaire property fund	Mar-05	69	1	Office
Thai commercial investment fund	Jun-10	66	4	Office
Tpark logistics property fund	Dec-09	54	15	Industrial
Gold property fund	May-07	54	1	Serviced apartment
Luxury real estate investment fund	Jun-08	52	1	Hotel
Quality hospitality leasehold property fund	Apr-08	50	1	Hotel
MFC-Nichada Thani property fund	Aug-05	36	2	Serviced apartment
Multi-national residence fund	Jun-08	34	3	Residential
Nichada Thani property fund 2	Apr-09	32	2	Residential
Bangkok commercial property fund	Nov-03	30	2	Office, retail
Mercure Samui property fund	Aug-10	27	1	Hotel

TU Dome residential complex property fund	Dec-06	27	3	Serviced apartment, retail
Sala @ Sathorn property fund	Aug-09	23	1	Office
Thai industrial fund 1	Jun-05	23	8	Industrial
101 Montri storage property fund	Aug-09	21	1	Industrial
JC property fund	Jan-07	21	1	Office
MFC-strategic storage fund	Aug-09	20	4	Industrial
Urbana property fund	Oct-07	16	1	Hotel, serviced apartment
Property perfect fund	Mar-08	16	2	Residential
UOB apartment property i (leasehold)	Oct-03	11	1	Service apartment

Sources: Author's compilation from various Thai-REIT annual reports

DATA AND METHODOLOGY

The data employed in this study consisted of monthly total returns of Thai-REITs, shares, property companies and bonds for the period from October 2003 to September 2010. Since the first Thai-REIT was listed in October 2003, it was chosen as the start of the assessment period. As there was no REIT index available for the Thai listed REITs, a value-weighted REITs index was constructed to represent listed REITs on the Stock Exchange of Thailand. Thai shares and bonds were represented by the Dow Jones Thailand Total Stock Market index and Long-term Government Bonds respectively. Securitised property was measured by the Dow Jones Thailand Real Estate index, while the risk-free rate was calculated using the Bank of Thailand 3-Month Bond Yields. All data was collected in local currency terms to maintain the consistency and equivalency of the analysis.

In this study, the risk-adjusted total returns of Thai-REITs, shares, property companies and bonds were analysed over the period from October 2003 to September 2010. The mean monthly returns were annualised to represent the average annual returns. Risk-adjusted returns were assessed using the reward-to-risk ratio and Sharpe ratio. Portfolio diversification benefits were assessed by correlations of Thai-REITs, shares, property companies and bonds. To fully understand the role of Thai-REITs within a mixed-asset portfolio, efficient frontiers for multi-asset portfolios and asset allocation diagrams were also conducted.

The analysis was further split in three sub-periods: October 2003 to September 2007 (Pre-GFC), September 2007 to March 2009 (GFC) and March 2009 to September

2010 in order to compare the dynamic interactions and effect of the global financial crisis on the performance of Thai-REITs. September 2007 and March 2009 were treated as the switching points of the three periods.

THAI-REIT PERFORMANCE ANALYSIS

Table 4 exhibits the performance analysis of Thai-REITs, bonds, shares and property companies over the period of October 2003 – September 2010. During the study period, Thailand's inflation averaged around 2.96% pa. The analysis reveals that Thai-REITs behaved distinctively different than shares and property companies over this period, due to their unique nature and characteristics. Thai-REITs provided the lowest annualised return of 0.56% p.a., significantly underperforming bonds (4.61% p.a.), shares (13.10% p.a.) and property companies (3.35% p.a.). In terms of risk level, Thai-REITs however recorded a lower level of risk (10.42%) than shares (27.54%) and property companies (35.92%). On a risk-adjusted basis, Thai-REITs were the poorest performing asset class, with reward-to-risk and Sharpe ratio of 0.05 and -0.20 respectively. The poor risk-adjusted performance reflects the restrictive regime of Thai-REITs, as compared to other REIT markets.

Table 4: Performance analysis: October 2003 – September 2010

	REITs	Shares	Property companies	Bonds
Annualized mean returns	0.56%	13.10%	3.35%	4.61%
Annualized risk	10.42%	27.54%	35.92%	2.49%
Reward-to-risk ratio	0.05	0.48	0.09	1.85
Sharpe ratio	-0.20	0.38	0.02	0.79

The correlation matrix for REITs, bonds, shares and property company returns over October 2003 – September 2010 is presented in Table 5. The data shows all correlations being statistically significant at less than the 5% level of significance. The strongest correlation was observed between shares and property companies (r=0.83), indicating that investors receive little diversification potential by diversifying from shares to property stocks during this period. Thai-REITs were moderately correlated with shares (r=0.67) and property stocks (r=0.67). This suggests that Thai-REITs could offer better diversification benefit for share investors than property stocks. Property investors could also receive some level of diversification by including REITs in an inter-property portfolio. On the other hand, bonds were negatively correlated to shares (r=-0.24), REITs (r=-0.37) and property stocks (r=-0.24), reflecting their defensive nature.

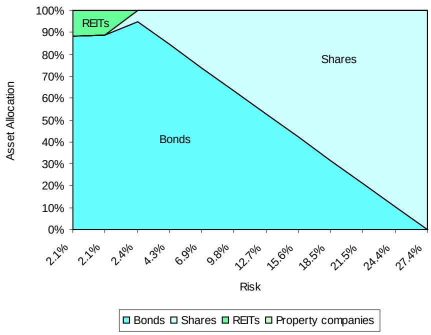
Table 5: Correlation matrix: October 2003 – September 2010

	REITs	Shares	Property companies	Bonds
REITs	1.00			
Shares	0.67*	1.00		
Property companies	0.67*	0.83*	1.00	
Bonds	-0.37*	-0.24 *	-0.24*	1.00

* Significant at 5% level.

Figure 2 shows the asset allocation diagram and efficient frontier of the mixed-asset portfolio consisting of Thai-REITs, bonds, shares and property companies over October 2003 – September 2010. During this period, shares and bonds were clearly dominant across the risk spectrum in the portfolio. The proportion of shares increased as the risk level surged, showing shares as a high-risk investment option for investors. Thai-REITs only entered into the portfolio at low risk levels, suggesting them as a low-risk asset class. Property companies didn't appear in the portfolios due to their poor performance, high risk and high correlation with shares. The efficient frontiers also show that Thai-REITs are better portfolio optimizers than listed properties, as the bond-share-REIT portfolio outperformed the bond-share-property portfolio across the risk spectrum.

Figure 2: Asset allocation diagram and efficient frontiers: October 2003 – September 2010



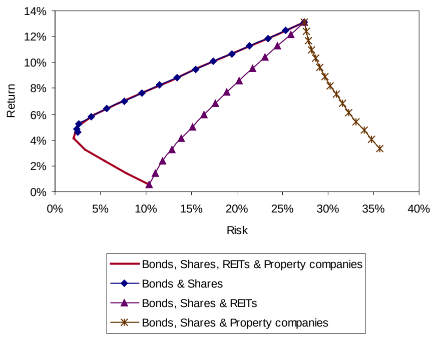


Figure 3 depicts the three-year rolling volatility analysis for different asset classes in Thailand over October 2003 – September 2010. The risk levels have increased considerably for all asset classes after October 2008 and remained at high levels until the end of the assessment period. This was due to the impact of the GFC which took place since mid-2007. The volatility of Thai-REITs (6.69%-12.33%) was lower than that of shares (21.79%-45.82%) and property stocks (14.78%-35.69%), reinforcing the implication that Thai-REITs are low-risk investment options.

The rolling three-year correlations are investigated over October 2003 – September 2010 as illustrated in Figure 4. Correlations of Thai-REITs with shares and property companies are showing similar patterns. Correlation levels had increased considerably from r=0.40 to r=0.80 since October 2008, hence reducing the diversification benefit of Thai-REITs for shares and property stocks. Correlations of Thai bonds with REITs and shares were on a declining trend from around r=0.00 to r=-0.40. They had risen sharply for a short period in November 2008, but dropped back to the stable level of around r=-0.40 afterwards, suggesting an improving diversification potential between bonds and the other assets.

Figure 3: 3-year rolling risk analysis: October 2003 – September 2010

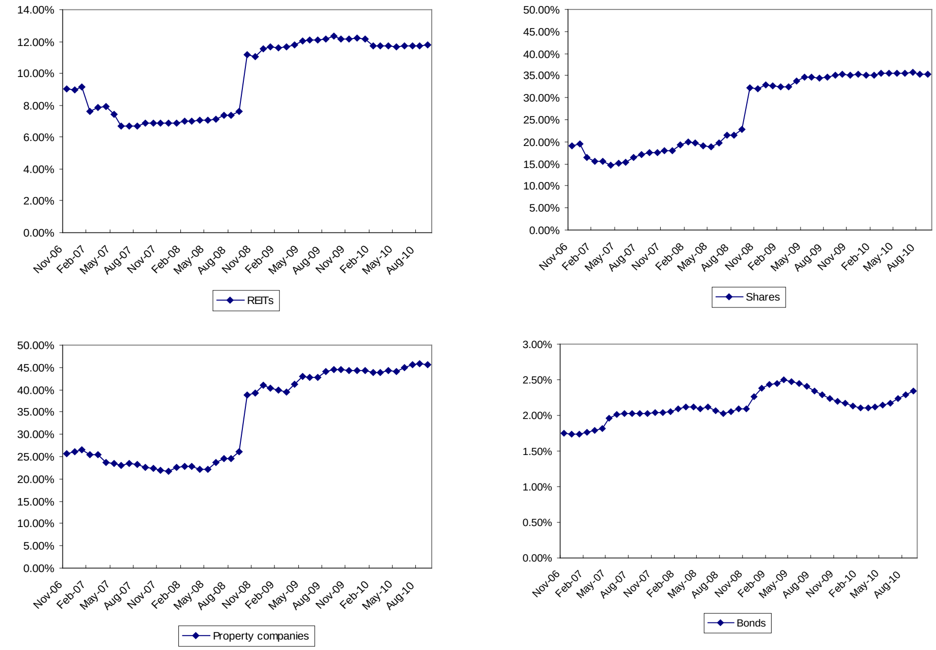
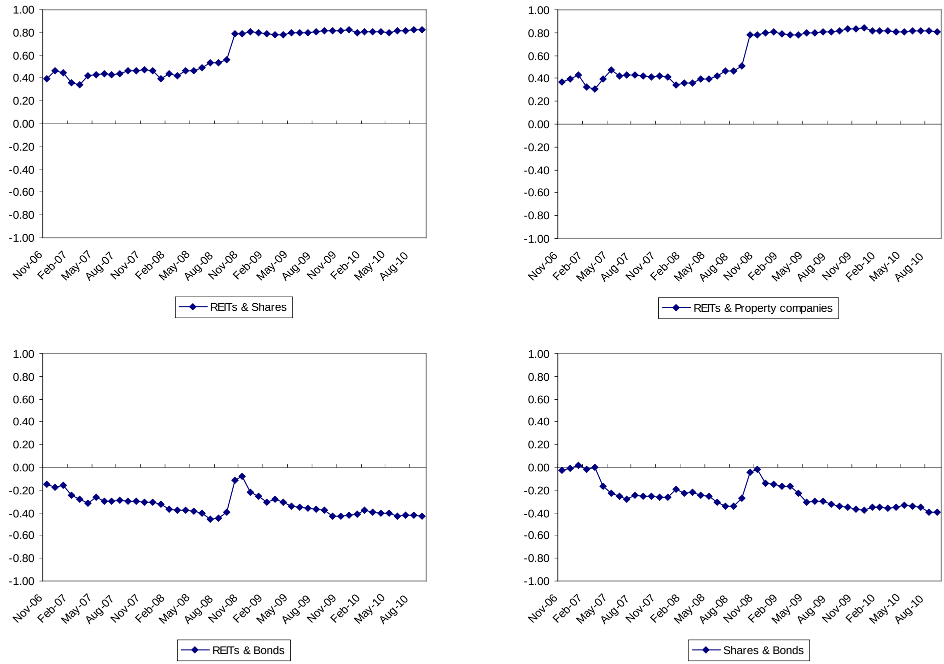


Figure 4: 3-year rolling correlation analysis: October 2003 – September 2010



THE IMPACT OF THE GLOBAL FINANCIAL CRISIS ON THAI-REITs

Table 6 demonstrates the impact of the GFC on Thai-REITs, bonds, shares and property companies over three sub-periods: pre-GFC (October 2003 - September 2007), GFC (September 2007 - March 2009) and post-GFC (March 2009 - September 2010). The effect of the GFC was clearly observed across all asset classes. Share and property stock returns were severely affected by the crisis, dropping from 15.95% to -29.85% and -4.14% to -44.08 respectively. Annualized average returns on Thai-REITs also went down from -4.20% to -8.81%. The GFC also lead to the increasing level of volatility across all asset classes. Risk levels of Thai-REITs rose by 64% (from 9.01% to 14.78%), which is less than that of shares (106% increase) and property companies (87% increase).

After the GFC, the performance of all asset classes has improved significantly as revealed in panel C of Table 6. Thai-REIT average returns increased to 24.09% p.a., while shares and property company returns increased significantly to 75.57% p.a. and

122.53%. Importantly, the annualised risk of Thai-REIT dropped to 5.08%, substantially lower than that of share (20.89%) and property companies (31.43%). This has helped to improve the risk-adjusted performance (measured by reward-to-risk and Sharpe ratios) of Thai-REITs, which was the best performing asset classe, as compared to other investment options. This suggests that investors have reacted positively to the new changes in Thai-REIT regulations.

The sub-period correlation analysis of Thai-REITs and other investment vehicles is presented in Table 7 over October 2003 – September 2009. Before the GFC, Thai-REITs have low correlations with both shares (r=0.46) and property companies (r=0.43) suggesting diversification benefits of Thai-REITs for shares and property investors. During the GFC, the diversification benefit for Thai-REITs has been reduced significantly, as correlations of Thai-REITs with shares and property companies have increased to r=0.86 and r=0.89 respectively. After the GFC, Thai-REITs have gained diversification potential, with correlations with shares and property companies falling back to low levels of r=0.39 and r=0.28 respectively. Bonds have always maintained negative correlations with other asset classes across all three periods, showing them as defensive investments.

Figure 5 exhibits the asset allocation diagram and efficient frontier for the mixed-asset portfolios over the three sub-periods: Pre-GFC (October 2003 - September 2007), GFC (September 2007 - March 2009) and post-GFC (March 2009 - September 2010). In the pre-GFC period, Thai-REITs played a minor role in the portfolio at low-risk levels, while shares and bonds dominated the portfolio across the risk spectrum. Thai-REITs did offer some diversification benefit to shares and bonds, while the inclusion of property companies only increased the level of risk. During the GFC, all efficient frontiers had negative slopes due to the negative returns of all asset classes. Thai-REITs however still offered risk reduction benefit to the portfolio, while property companies replaced shares in the asset allocation diagram. After the GFC, Thai-REITs have clearly increased their significance in the mixed-asset portfolio across the risk spectrum. Thai-REITs and property companies dominate the portfolio at high risk levels. This reflects Thai-REITs' strong performance, offering high-returns and low risk to the portfolio.

Table 6: Impact of the global financial crisis on Thai-REITs

Panel A: October 2003 - September 2007: pre-GFC

	REITs	Shares	Property companies	Bonds
Annualized mean returns	-4.20%	15.95%	-4.14%	4.95%
Annualized median returns	-5.20%	23.20%	-2.83%	4.96%
Annualized risk	9.01%	19.84%	25.74%	1.86%
Reward-to-risk ratio	-0.47	0.80	-0.16	2.66
Sharpe ratio	-0.81	0.65	-0.28	1.01

Panel B: September 2007 - March 2009: GFC

	REITs	Shares	Property companies	Bonds
Annualized mean returns	-8.81%	-29.85%	-44.08%	4.49%
Annualized median returns	-1.95%	-2.56%	-21.19%	4.56%
Annualized risk	14.78%	40.83%	48.09%	2.61%
Reward-to-risk ratio	-0.60	-0.73	-0.92	1.72
Sharpe ratio	-0.79	-0.80	-0.98	0.60

Panel C: March 2009 - September 2010: post-GFC

	REITs	Shares	Property companies	Bonds
Annualized mean returns	24.09%	75.57%	122.53%	3.85%
Annualized median returns	27.22%	112.47%	77.41%	3.90%
Annualized risk	5.08%	20.89%	31.43%	1.25%
Reward-to-risk ratio	4.74	3.62	3.90	3.08
Sharpe ratio	4.50	3.56	3.86	2.10

Table 7: Sub-period correlation analysis between Thai-REITs, bonds, shares and property companies

Panel A: October 2003 - September 2007: pre-GFC

	REITs	Shares	Property companies	Bonds
REITs	1.00			
Shares	0.46*	1.00		
Property companies	0.43*	0.64*	1.00	
Bonds	-0.22	-0.15	0.11	1.00

Panel B: September 2007 - March 2009: GFC

	REITs	Shares	Property companies	Bonds
REITs	1.00			
Shares	0.86*	1.00		
Property companies	0.89*	0.92*	1.00	
Bonds	-0.31	-0.22	-0.25	1.00

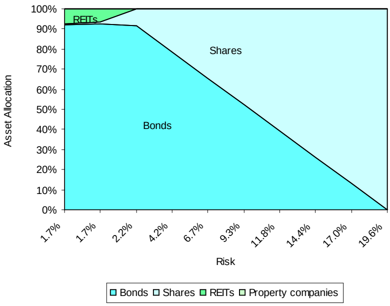
Panel C: March 2009 - September 2010: post-GFC

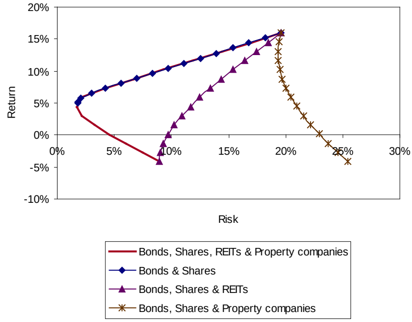
	REITs	Shares	Property companies	Bonds
REITs	1.00			
Shares	0.39	1.00		
Property companies	0.28	0.84*	1.00	
Bonds	-0.07	-0.39	-0.40*	1.00

* Significant at 5% level.

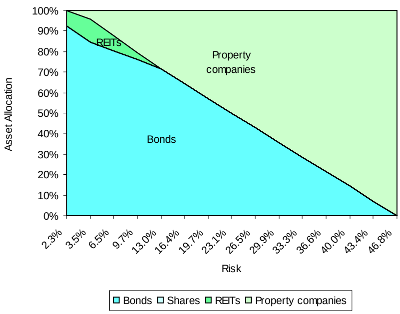
Figure 5: Sub-period asset allocation diagrams and efficient frontiers

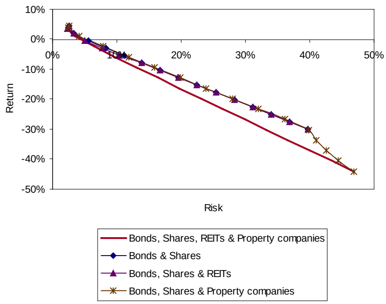
October 2003 - September 2007: pre-GFC



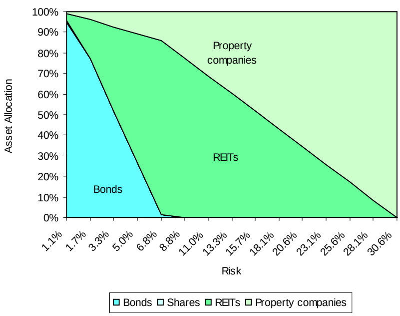


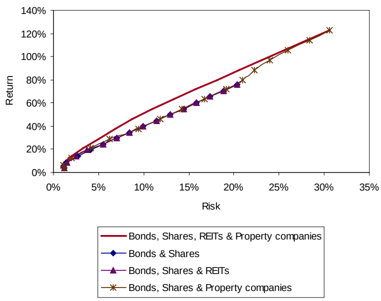
September 2007 - March 2009: GFC





March 2009 - September 2010: post-GFC





CONCLUSION

Since their introduction in 2002, Thai-REITs have become an important investment vehicle for the country, with 27 listed REITs as of October 2010. However, with many restrictions in place, Thai-REITs are characterised by their small size, low real estate exposure and lack of participation from institutional investors. As Thai-REITs are moving towards international practices with a less restrictive regime, they offer opportunities and challenges for institutional investors. This paper primarily seeks to examine the performance of Thai-REITs over time and their significance in a mixed-asset portfolio.

Several strategic implications to property investors can be drawn from this study. The analysis revealed that the role of Thai-REITs in a mixed-asset portfolio varied over time. Pre-GFC and during the GFC, Thai-REITs only played a minor role in the mixed-asset portfolio at low risk levels due to their poor risk-adjusted performance. However, the period post-GFC saw Thai-REITs gaining a significant position in the portfolio, as the inclusion of Thai-REITs reduced risk and enhanced returns of the mixed-asset portfolio. In addition, the study also suggests that Thai-REITs offer a low-risk investment option and a better portfolio optimizer than property companies for shares investors. Nevertheless, investors are advised to actively manage their portfolios due to the unsymmetrical nature of Thai-REITs' risk and return characteristics. The new changes in regulatory structure might also lead to Thai-REITs exposure to higher levels of risk. Given the limitations of the data, this study provides a preliminary assessment on the performance of Thai-REITs in a mixed-asset portfolio. More in-depth analysis should be done once data becomes more sufficient over a longer timeframe.

REFERENCES

Boonsong, S., and Charoenwongse, S. (2010). *Baker & McKenzie's update on Thai REIT law*. Baker & McKenzie, Bangkok.

CBRE. (2010). *REITs around Asia 1H2010*. CB Richard Ellis, Hong Kong.

Chiang, Y. H., So, C. K. J., and Tang, B. S. (2008). "Time-varying performance of four Asia-Pacific REITs." *Journal of Property Investment & Finance*, 26(3), 210-231.

Kim, B. S. (2009). "The impact of the global financial crisis on Asia-Pacific real estate markets: evidence from Korea, Japan, Australia and US REITs." *Pacific Rim Property Research Journal*, 15(4), 398-416.

Kutsuna, K., Dimovski, W., and Brooks, R. (2008). "The pricing and underwriting cost of Japanese REIT IPOs." *Journal of Property Research*, 25(3), 221-239.

Lee, C. L., and Ting, K. H. (2009). "The role of Malaysian securitised real estate in a mixed-asset portfolio." *Journal of Financial Management of Property and Construction*, 14(3), 208-230.

Lin, T. C. (2007). "The development of REIT markets and real estate appraisal in Taiwan." *Journal of Real Estate Literature*, 15(2), 281-301.

Liow, K. H., and Adair, A. (2009). "Do Asian real estate companies add value to investment portfolio?" *Journal of Property Investment & Finance*, 27(1), 42-64.

Liow, K. H., and Sim, M. C. (2006). "The risk and return profile of Asian real estate stocks." *Pacific Rim Property Research Journal*, 12(3), 283-310.

Macquarie. (2010). *Global property insight*. Macquarie Equities Research.

Newell, G., Liow, K.H., Ooi, J., and Haihong, Z. (2005). "The impact of information transparency and market capitalisation on out-performance in Asian property companies." *Pacific Rim Property Research Journal*, 11(4), 393-411.

Newell, G., and Peng, H. W. (2009). "The impact of the global financial crisis on A-REITs." *Pacific Rim Property Research Journal*, 15(4), 453-470.

Newell, G., Ting, K. H., and Acheampong, P. (2002). "Listed property trusts in Malaysia." *Journal of Real Estate Literature*, 10(1), 109-118.

Newell, G., Chau, K.W., Wong, S.K. and Liow, K.H. (2009). "The significance and performance of property securities markets in the Asian IFCs." *Journal of Property Research*, 26(2), 125–148.

Newell, G., Wu, Y., Chau, K. W., and Wong, S.K. (2010). "The development and performance of REITs in Hong Kong." *Pacific Rim Property Research Journal*, 16(2), 191-206.

Ooi, J. T. L. (2009). "The compensation structure of REIT managers: impact on stock valuation and performance." *Journal of Property Research*, 26(4), 309-328.

Ooi, J. T. L., Newell, G., and Sing, T.F. (2006). "The growth of REIT markets in Asia." *Journal of Real Estate Literature*, 14(2), 203-222.

Pholphirul, P., and Rukumnuaykit, P. (2009). "The real estate cycle and real business cycle: Evidence from Thailand." *Pacific Rim Property Research Journal*, 15(2), 145-165.

Quek, M. C. H., and Ong, S. E. (2008). "Securitising China real estate: a tale of two China-centric REITs." *Journal of Property Investment & Finance*, 26(3), 247-274.

Sing, T. F., and Ling, S. C. (2003). "The role of Singapore REITs in a downside risk asset allocation framework." *Journal of Real Estate Portfolio Management*, 9(3), 219-235.

TRUST. (2010). *Asia-Pacific REIT survey*. The Trust Company.

Vanichvattana, S. (2007). "Thailand Real Estate Market Cycles: Case Study of 1997 Economic Crisis." *GH Bank Housing Journal*, 1(1), 38-47.

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