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The significance of property sector diversification and regional diversification for property investment

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Abstract

We buy real estate for one of two reasons. The first reason is to provide a shelter for us or to place our businesses. The second reason is an investment for income stream through rentals. Residential property for many years has been the money-making portfolio for most investors surveyed (Atsir, 1993). Therefore, other than commercial and industrial properties, residential property investment could also provide return to investors by rental growth and capital appreciation. Portfolio managers and investors are often making investment decision either diversify their investment through geographic or property sector. The Malaysian House Price Index is used and was obtained from National Property Information Centre (NaPIC) at Valuation and Property Services Department (VPSD). The study areas include Kuala Lumpur, Selangor, Johor and Pulau Pinang from year 1994 until year 2003 to find out whether diversification within a region by property sector is better than diversification within property sector by region or vice versa. The correlation coefficient analysis is used to compare the diversification by the average correlation for property sector and regional. The efficient frontier then was formed to determine the performance of each property and region. The finding of this study shows the regional diversification is more significance than property sector diversification.

Keywords: Diversification, Housing, Property Investment.

Introduction

Residential is not only a place for stay but it can also be an investment purpose. Return from residential is driven by rental growth and capital appreciation. Different types of property and different regional will give different return to investors.

Risk in direct property investment can be reduced through property sector diversification or geographic diversification, and in theory, there is no cost of diversification (Eichholtz *et al.*, 1995; Newell and Tan, 2004; Lee and Byrne, 1998; Fisher and Liang, 2000). Thus, diversified portfolio is able to minimize the risk and maximizing the expected return.

Investors and portfolio manager should consider on how to build a well-diversified portfolio in property investment. Should they diversify through property sector, regional or property size? The study concerns the comparison of diversification by property types and regional.

Eichholtz *et al.* (1995) had asked a question that starting from one property type in one region, whether it is more efficient to diversify across region within a single property type or across property within a region. Briefly, its mean, whether investors remain in one region and seek diversification by property types in the region or diversify across region but remain within the property type (Eichholtz *et al.*, 1995; Lee dan Byrne, 1998).

Over build and abundant of residential property is a common issue in Malaysia. In Property Market Status Report 2004, it is show that at the end of second quarter in 2004, the number of unsold residential property was 11,199 units with total value of RM1.471 billion. By comparing with the previous quarter, the number of unsold residential property was increased by 8.2% and values up by 3.5%.

Because of many types of residential and regional in Malaysia, it become a problem to portfolio manager or single investors who are still not involved in Malaysia real estate market and wish to invest in Malaysia. They need to consider either to construct a portfolio through property sector or regional diversification.

Thus the main purpose of this paper is to identify whether sector diversification is more important than regional diversification or vice versa and to examine the asset allocation in a portfolio. Due to limiting data, the study areas on residential property are Kuala Lumpur, Selangor, Johor and Pulau Pinang. The period of study is only from year 2000 to year 2003.

Literature Review

For real estate portfolios, there are two approaches of defining diversification categories which are property type and geographic region (Eichholtz *et al.*, 1995; Newell and Tan, 2004; Lee and Byrne, 1998; Fisher and Liang, 2000). Besides the property type and geographic region diversification, diversification by property size and metropolitan (Seiler *et al.*, 1999) are another two categories of diversification. Investors can decide either diversifies their investment through property type, geographic, property size or metropolitan.

In essence portfolio theory states the risk relating to a portfolio of investments may be reduced through sensible diversification (Dubben and Sayce, 1991).

While some understanding of the potential benefits of diversification have long been recognized, the development of a quantitative theory only dates from the 1950s, when Markowitz published an article and subsequently a book, on portfolio selection (Dubben and Sayce, 1991). Mean-Variance Analysis (Markowitz's approach) provides both a theoretical justification for diversification and analytical framework for assembling individual securities in such way as to achieve proper diversification (Farell, 1997). Besides that, the Markowitz model shows the proper goal of portfolio construction should be to produce a portfolio that provides the highest return at a given risk. A portfolio, having this characteristic is known as an efficient portfolio and has been accept as the paradigm of optimal portfolio construction (Farell, 1997).

In essence portfolio theory states the risk relating to a portfolio of investments may be reduce through sensible diversification (Dubben and Sayce, 1991). Mansfield (1999) found that there is a broad consensus to the risk associated with investment in the private rent sector, including liquidity, management cost, voids, taxation, public perception and political uncertainty. The ability to measure the inherent and comparative performance of a whole or part of any portfolio is essential for any investors. Hargitay and Yu (1993) and Mansfield (1999) divide portfolio strategy such as selection, allocation and timing. Gallimore *et al.* (2000) seek out the investment strategy include market timing, exploiting and opportunity and adding value in his study.

Retail, offices and industrial properties which, when let, are collectively known as "business premises" (Dubben and Sayce, 1991). Each type of real estate has different market because each interests different investors (Ferguson *et al.*, 1986). There are many properties that can be invest, those are vacant land, residential, hotel and motel, office building, retail and shopping centre, industrial and warehouse.

However, due to the limitation of data, the property of analysis for the study is only focus on residential sector. Teymur (1993) define housing as "one building type which literally every human being uses most hours of their day". Another definition of housing from him is "houses are the most common, the smallest, and the most "ordinary" of the buildings, yet, they make up most of the physical fabric of cities towns and villages, and have the richest social and cultural meanings embedded in them". Marbeck (1994) has classified the various types under two headings, that is traditional housing (low-cost housing, terraced/ clustered/ linked house, semi-detached houses, detached houses, flat and apartments) and condominiums.

Study area

There are four states of study those are Kuala Lumpur, Selangor, Johor and Pulau Pinang.

Kuala Lumpur

Residential property in Kuala Lumpur absorbed the highest breakdown compare with other sectors (83.10%). Follow by commercial (12.20%), industrial (2.40%), and development land (2.30%). The supply of residential in KL was increased from year 2000 to year 2003. The supply of residential in year 2000 was 257,392 and increase to 297,665 units in the year of 2003. From year 2000 to year 2001, the supply was rise 5.5%; from year 2001 to year 2002 it was growth 8,088 units (279,753 units in year 2002).

The average value for the first quarter (January to March) in KL was RM291,805 then decreased to RM270,456 at quarter two (April to June). After a growth in the third quarter (July to September) at RM195,282 and achieved the highest value at the last quarter (October to December) of year 2003 (RM306,551).

The overhang of high-rise building was the main problem of property overhang in Kuala Lumpur. It had the most units of property overhang if compare to other types of residential in Kuala Lumpur. Detached houses, cluster and low-cost were found that no had the problem of overhang in Kuala Lumpur.

Selangor

Selangor is the most developed, industrialised and diversified state in the country. Covering an area of approximately 8,000 sq. km, it is the most populated state with approximately 4 million populations.

Residential property in Selangor had the highest percentage of breakdown, which is 77.20%. Follow by commercial 7.10%, agriculture 6.80%, industrial 5.20%, development land 3.40% and other is only 0.20%. The supply of residential property in Selangor was increased continually from year 2000 to year 2003. There was the highest growth of supply for residential from the year of 2000 to year 2001, which is increased to136,182 units. From year 2001 to year 2002, the supply rose to 53,753 units and increased to 94,802 units from year 2002 to year 2003.

The average value of residential in Selangor was increased from year 2000 to year 2002 then drop from year 2002 to year 2003. The average value of residential in the first quarter was RM170,644, increase to RM199,136 at the second quarter and continually rise to RM233,869 at the third quarter of the year 2003. Then, the average value was dropped to RM199,905 at the fourth quarter.

The terraced houses, low-cost and high-rise building had the bad performance in Selangor. The unit of overhang for terraced houses was increase from 260 units in quarter four of the year 2003 to 564 units in quarter two of the year 2004. Besides the unit of overhang for low-cost and high-rise were also growth from quarter four of the year 2003 to quarter two 2004.

The total of overhang for residential in Selangor was only 762 units in quarter four of the year 2003 and increase to 1,427 units at the quarter one in the year 2004. Subsequently, the units of overhang was rise 234 units from quarter one to quarter two of the year 2004.

Johor

Johor is known as the “Southern Gateway” and the third largest state in peninsular Malaysia. It covers 19,984 sq. km on the southern part of the peninsular. Johor Bahru is connected to Singapore via air, sea, road and rail making the state accessible from Singapore. Johor is also one of the most developed states in the country, its economy based on a mix of agriculture, manufacturing, commerce and tourism.

The breakdown of residential property had the highest percentage that is 66.20%. The second highest is agriculture which is 20.80%, followed by commercial 7.40%, development land 3.80%, industrial 1.70% and others is

0.10%. The supply for residential property in Johor increased from year 2000 to year 2003. The supply is slightly increasing from year 2001 to year 2003. The number of residential units in year 2000 was 411,285 units, increased to 487,823 units in year 2001. In year 2002, the supply of residential was 513,934 and then increases 4.1% to 535,268 units.

The average value of Johor is quite stable between RM135,000 to RM140,000. The average value in the first quarter was RM137,802. At the second quarter was dropped to RM136,069 and increased a bit at the third quarter (RM136,311). At the last quarter of year 2003, the average value of Johor is RM138,559.

Johor had the worst performance between the four states of case study because it had the most units of overhang. There was only cluster had no the problem of overhang in Johor. The unit of overhang for terraced house was up to one thousand, follow by high-rise building, the unit of overhang was up to seven hundred. The total units of overhang for residential in Johor was up to two thousands and increased from the quarter four in the year 2003 to quarter two in the year of 2004. The total unit of overhang at the quarter four in the year 2003 was 2,266 units; 2,411 units of overhang at the quarter one of year 2004; 2,918 units at the quarter two of year 2004.

Pulau Pinang

The state of Pulau Pinang, comprises a 285 sq. km island and a 760 sq. km strip of land on the mainland known as Seberang Perai (Province Wellesley). The two regions are linked by the 13.5km Penang Bridge. The British who ruled the island for more than a century fondly referred to the island of Penang as “The Pearl of the Orient”.

Residential was occupied the highest breakdown percentage (75.20%). Follow by commercial 9.10%, development land had 8.40%, agriculture 4.0%, industrial 2.50% and lastly others was 0.80%. The supply of residential units rose from year 2000 to year 2003. From year 2000 to year 2001, the supply was increased 15%; from year 2001 to year 2002, it was growth 4.6% and from year 2002 to year 2003, the supply was increased to 259,492 units.

The average value of residential in Pulau Pinang was smoothly increased from the first quarter to the fourth quarter of the year 2003. The average value in the first quarter was RM161,049 and then it rose to RM170,000 from the first quarter to the second quarter. At the third quarter the average value is RM167,371 and increased to RM170,979 in the last quarter of year 2003.

The overhang for residential property in Pulau Pinang includes terraced house, semi-detached houses, low-cost and high-rise building. Detached houses, town house and cluster were found that no overhang in Pulau Pinang. The unit of overhang in Pulau Pinang decreased from quarter four of the year 2003 (1,059 units) to 913 units at the quarter one for the year 2004 and continually dropped to 777 units at the quarter two for the year 2004.

Data

The data of The Malaysian House Price Index (MHPI) is used in this study which was obtained from Valuation and Property Service Department (JPPH). There are a number of limitations with the data sources. First, the index for commercial and industrial property is unavailable in Malaysia, thus the

diversification for property can be done on residential sector. Secondly, MHPI is only indicating the overall housing price for a state, there is no detail of house price for district. However, whatever the limitations, these indices probably could view the property market movement and should be reasonably be analyzed for the purpose of the study.

Sampling

Property types

National Property Information Centre (NAPIC) was established at 9 September 1999 but it already started the operation on 1 September 1999. Currently the index available for NAPIC is only house price index.

Regional

In the Property Market Report (2003), Kuala Lumpur, Selangor, Johor and Pulau Pinang presented the best performance of breakdown among the others in year 2003. Most of the transactions in those states involved residential property. Thus Kuala Lumpur, Selangor, Johor and Pulau Pinang were selected as case study.

Period

The data used in this study was from year 1994 until year 2003. As we know, in the year of 1995 and 1996 the economy of our country was boom, thus it is directly influence the property market. But in the year of 1997 Malaysia's economy was depressed, the property market at that time was down. Starting from year 2000 until now our economy was in the period of recovery.

Analysis and finding

The significance of residential sector diversification and regional diversification was determined by using efficient frontier and average correlation. And lastly the asset allocation of portfolio had been examined. The performance of residential sector and regional was determined by using descriptive analysis and correlation coefficient.

The mean and standard deviation of residential sector can is presented in Figure 1. The risk of detached house and semi-detached houses are higher than terraced houses but the expected return of this two type of housing is lower than terraced house. The result concludes that detached houses and semi-detached houses present a bad performance in terms of investment.

Terraced houses was had a best performance is compare to the other type of houses, its' risk is the lowest but the expected return of it is the highest. Followed by high-rise building, its' risk is lower than detached houses and semi-detached houses but its' expected return is higher than semi-detached houses.

Table 4 shows the correlations for the entire residential sector are high. It is not surprising of the result because all the property types used for the analysis are residential property. Kuala Lumpur provides the highest expected return but also the highest risk to investors. Pulau Pinang presents the second highest expected return but the lowest risk compare to other states. The expected return of Selangor is lower than Pulau Pinang but the risk is higher

than Pulau Pinang. Johor has the lower performance compare to Selangor and Pulau Pinang. The risk of Johor is higher than these two states but the expected return is lower than Selangor and Pulau Pinang.

Table 6 displays the correlation of the four states which is positive, it means the return movement of these four regions is at the same way. The overall correlation for these four regions is medium. The highest correlation is Kuala Lumpur and Selangor (0.8458) because Kuala Lumpur is located at the middle of Selangor. The correlation between Kuala Lumpur and Pulau Pinang is the lowest (0.4179). Investing in different states in Malaysia will be bring diversification benefit because the correlation of those regions is quite low.

Figure 3 is clearly indicated that regional perform the better diversification than residential sector. The frontier of regional (contains Kuala Lumpur, Selangor, Johor and Pulau Pinang) lies above of the residential frontier (contains terraced houses, high-rise, detached houses and semi-detached houses). Thus the frontier of regional are able to provide the higher expected return at the same level of risk with frontier of residential. For instant, at a risk level of 0.06 the expected return of residential is higher than regional which is 0.0517 and 0.0464.

In other words, regional diversification can reduce the risk of a portfolio. For instant the expected return is 0.045, the standard deviation of residential sector is 0.0464 while the standard deviation of regional is 0.0517. The lower of correlations are indicated the higher diversification benefit. Base on Table 4 and 6, the average correlation for regional (0.5996) in the study area is lower than the property types (0.7948) in the study area. Hence the result indicated that diversification by regional is more important than diversification by residential sector.

By applying Markowitz's efficient frontier, there is no allocation of investment for detached houses and semi-detached houses. It was not a surprise result because in common sense an investor will not willing to buy a high value property and then rent it to other people. Normally they will occupy the property themselves. In the other way, a residential renter will not willing to pay a high amount to rent a house because it is better for the renter to own a house with the amount of money. The efficient frontier in Figure 1 shows that the maximum risk and expected return of the portfolio is 0.0485 and 0.0609. The minimum portfolio of it is 0.0427 (expected return) and 0.0594 (risk). The differences between the maximum and minimum return and risk are very less, which is only 0.58% and risk is 0.15%. It indicated that the combination of asset in this frontier is almost the same level of expected return and risk.

More of the allocation is in terraced houses and high-rise building. Normally investors prefer to buy terraced houses for the purpose of investment because the affordable price. Other than that, they can earn profit by rental from terraced house. Terraced house has grown into one of the main residential property type in the country, and has come to be recognised as the principle form of housing for the middle-income group (Prasad, 2005).

The preference for high-end condos is spurred by the return of expatriates – usually, these properties are bought for investment and the only way to realise the (investment) objectives is to rent them out to foreigners. The rental returns from high-end condominiums near the Kuala Lumpur City

Centre (KLCC) has improved and gross yield have gone up to 10% a year, which is considered “very good” (Personal money, 2004).

For the regional, the assets are mostly allocated in Kuala Lumpur and Pulau Pinang. In the lowest risk of portfolio, there is unavailable of allocation in Kuala Lumpur; Kuala Lumpur had allocation at the higher risk and higher expected return of portfolio. Selangor and Johor had the opposite tragedy with Kuala Lumpur, the asset allocation of this two states were only available portfolio of lower risk; lower expected return. There were no allocations for Selangor and Johor at the portfolio of higher risk; higher return portfolio.

The rental market in Johor Bahru is a bit slow-moving, largely because of the market over-supply. Rentals are also rather dependent on people working in Singapore and thus follow their demand – if the demand is low, then the rentals falls. In the northern region Pulau Pinang, especially on the island, the rental rate fluctuates often as the market has a mix local tenants and tourists based on seasons (Personal Money, 2004).

Property Market Status Report (2004) exhibited Johor had the most number of overhangs (3,175 units). Johor had the most number of unsold terraced units (1,986) in the country. Conversely, Selangor led by having the most number of unsold condominium/apartment (716 units) followed by Johor (673 units). Compare to other states in this study, Johor and Selangor had the poor performance because there are numerous of property overhang in these two states.

The size of Johor may be another reason of less asset allocation in it. Example, investors are interest to invest in Johor Bahru because of its’ location, but Johor Bahru is only a small part of Johor. For instant, refer to the Property Market Report 2003, the highest price of single storey semi-detached houses at Johor Bahru is RM355,000 (Taman Sri Setia), RM219,000 (Taman Kota Jaya) at Kota Tinggi, RM188,000 (Taman Sri Emas 4) at Muar, RM168,000 (Taman Rekamas 3) at Simpang Rengam, RM162,000 (Taman Desa) at Kluang and Rm158,000 (Taman Yayasan) at Segamat. We can see that there has a large gap of semi-detached houses price between Johor Bahru and other districts of Johor. Thus it is hard to attract investors to invest in Johor.

The maximum portfolio of regional in the frontier is 0.1014 (risk) and 0.0585 (expected return). While the minimum risk is 0.0503 with 0.0445 expected return. The difference of risk for this frontier is 5.11% while the difference of expected return is 1.4%. The different between risks is more than expected return. It means investor have to bear the 5.11% increment of risk from the portfolio of lowest risk and return to the portfolio of highest risk and return. But they only can earn more 1.4% of return from the portfolio of lowest risk and return to the portfolio of highest risk and return.

Conclusion and recommendation for further study

This study had considered diversification within a property portfolio. The data of The Malaysian House Index for four housing types, those are terraced houses, high-rise building, detached houses and semi-detached houses; and four regions including Kuala Lumpur, Selangor, Johor and Pulau Pinang were used for analysis.

In the result of analysis, terraced houses for study area are able to provide the highest expected return with the lowest risk compare to other

residential sector. Follow by high-rise building provides the second lower of risk at the 2.5% of expected return.

Apart from the above, analysis was also showing that Johor present the lowest performance in the context of diversification. Kuala Lumpur provides the highest expected return and the highest risk. The analysis is indicated investor invest in one type of property within various states in Malaysia is more diversify than invest in one region with various residential sector.

In terms of allocation, for residential sector, there are only terraced houses and high-rise building have the allocation. Terraced houses present the best performance because it provided the highest return but the lowest risk compare to other residential sector. For regional, Kuala Lumpur and Pualu Pinang have the most allocation.

The suggestion for investor or portfolio manager that investing in terraced houses within the study area in Malaysia will be more diversified. Generally, this study has highlighted that regional diversification is more significant than property sector in Malaysia. In the review of the above study, Markowitz's portfolio theory is still valid. The previous research (Liang *et al.*, 1996; Foort Hamelink and Martin Hoesli, 2003; Piet M. A. Eichholtz *et al.*, 1995) was critic about the shortcoming of theory Markowitz. It may influence the result become less accuracy. The property sector of analysis in this study is only residential property. Most of the research are use mix property such as residential, commercial and industrial as their property types of study.

Table 1: Percentage changes of residential types

Year	Terraced	High-Rise	Detached	Semi-Detached
1994	8.52%	11.80%	19.67%	14.35%
1995	15.37%	15.46%	30.83%	15.30%
1996	11.04%	1.08%	12.35%	15.11%
1997	6.89%	1.80%	9.11%	0.28%
1998	-5.75%	-9.13%	-22.94%	-7.15%
1999	-0.73%	-4.33%	-21.57%	-21.56%
2000	7.67%	0.78%	7.38%	8.64%
2001	-1.97%	2.72%	2.00%	-0.42%
2002	5.05%	-3.21%	-2.08%	1.06%
2003	2.38%	8.73%	-1.45%	-1.11%

Table 2: Percentage changes of regional

Year	Kuala Lumpur	Selangor	Johor	Pulau Pinang
1994	10.67%	9.18%	10.35%	6.60%
1995	29.37%	14.54%	12.16%	9.43%
1996	11.82%	8.37%	9.64%	4.90%
1997	1.56%	10.45%	1.36%	11.24%
1998	-9.48%	-6.59%	-5.87%	-5.79%
1999	-4.08%	-4.85%	3.66%	3.76%
2000	10.62%	5.93%	11.11%	2.25%
2001	1.60%	3.50%	-12.30%	2.90%
2002	5.51%	2.13%	-4.10%	-0.29%
2003	0.93%	2.84%	2.14%	12.57%

Table 3: Descriptive statistical of residential sector

	Terraced	High-Rise	Detached	Semi-Detached
1994	8.52%	11.80%	19.67%	14.35%
1995	15.37%	15.46%	30.83%	15.30%
1996	11.04%	1.08%	12.35%	15.11%
1997	6.89%	1.80%	9.11%	0.28%
1998	-5.75%	-9.13%	-22.94%	-7.15%
1999	-0.73%	-4.33%	-21.57%	-21.56%
2000	7.67%	0.78%	7.38%	8.64%
2001	-1.97%	2.72%	2.00%	-0.42%
2002	5.05%	-3.21%	-2.08%	1.06%
2003	2.38%	8.73%	-1.45%	-1.11%
MEAN	0.0485	0.0257	0.0333	0.0245
SD	0.0609	0.0716	0.1587	0.1096

Table 4: Correlation between residential sector

	Terraced	High-Rise	Detached	Semi-Detached
Terraced	1			
High-Rise	0.6847	1		
Detached	0.8956	0.8452	1	
Semi-Detached	0.8000	0.6504	0.8927	1

Average correlation: 0.7948

Table 5: Descriptive statistical of regional

	Kuala Lumpur	Selangor	Johor	Pulau Pinang
1994	10.67%	9.18%	10.35%	6.60%
1995	29.37%	14.54%	12.16%	9.43%
1996	11.82%	8.37%	9.64%	4.90%
1997	1.56%	10.45%	1.36%	11.24%
1998	-9.48%	-6.59%	-5.87%	-5.79%
1999	-4.08%	-4.85%	3.66%	3.76%
2000	10.62%	5.93%	11.11%	2.25%
2001	1.60%	3.50%	-12.30%	2.90%
2002	5.51%	2.13%	-4.10%	-0.29%
2003	0.93%	2.84%	2.14%	12.57%
MEAN	0.0585	0.0455	0.0281	0.0476
SD	0.1014	0.0629	0.0784	0.0525

Table 6: Correlation between regional

	Kuala Lumpur	Selangor	Johor	Pulau Pinang
Kuala Lumpur	1			
Selangor	0.8458	1		
Johor	0.6756	0.5680	1	
Pulau Pinang	0.4179	0.6611	0.4292	1

Average correlation: 0.5996

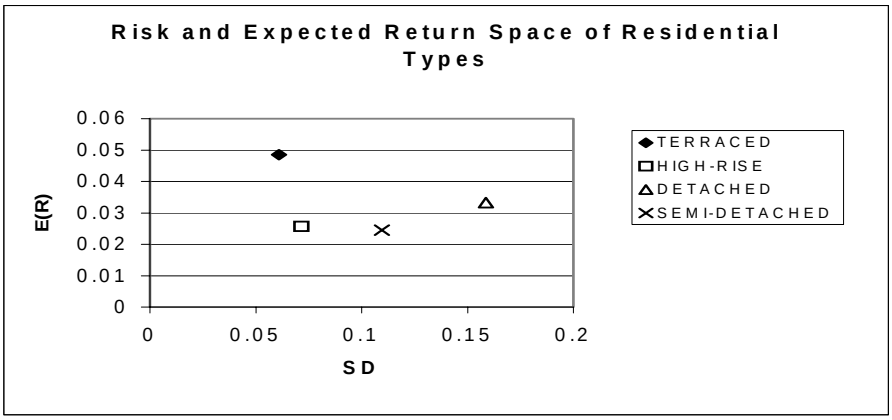

Figure 1: Risk and expected return space of residential sector

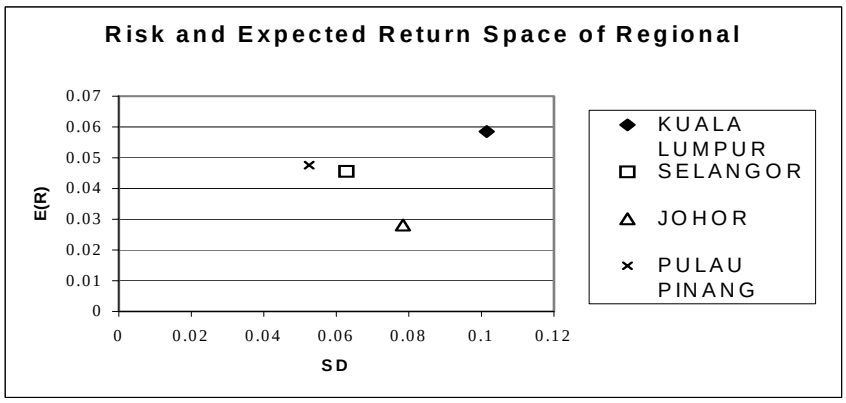

Figure 2: Risk and expected return space of regional

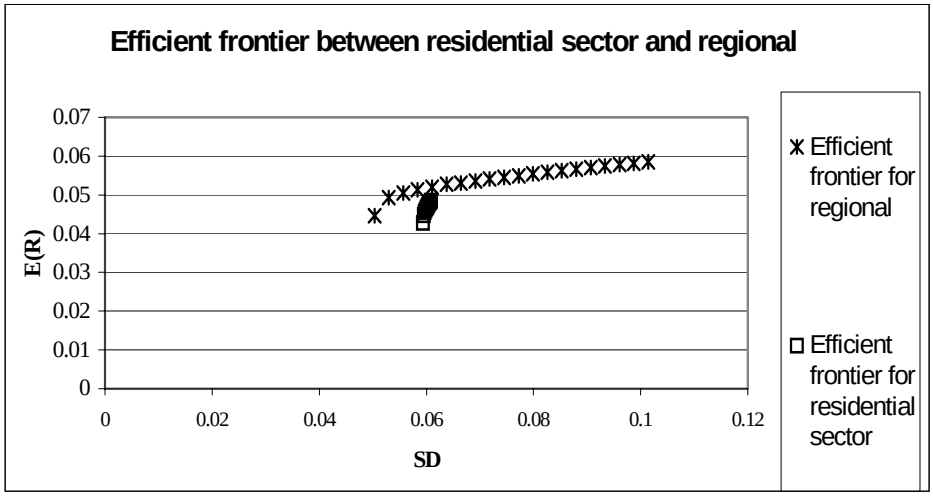

Figure 3: Comparison of efficient frontier between property sector and regional

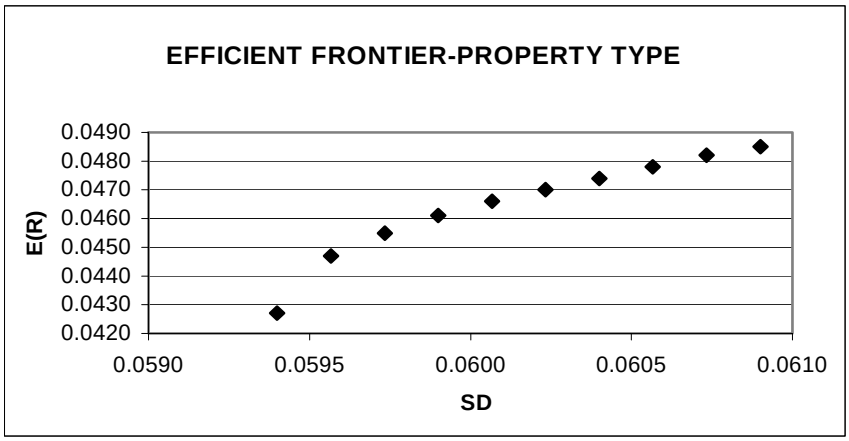

Figure 4: Efficient frontier of residential sector

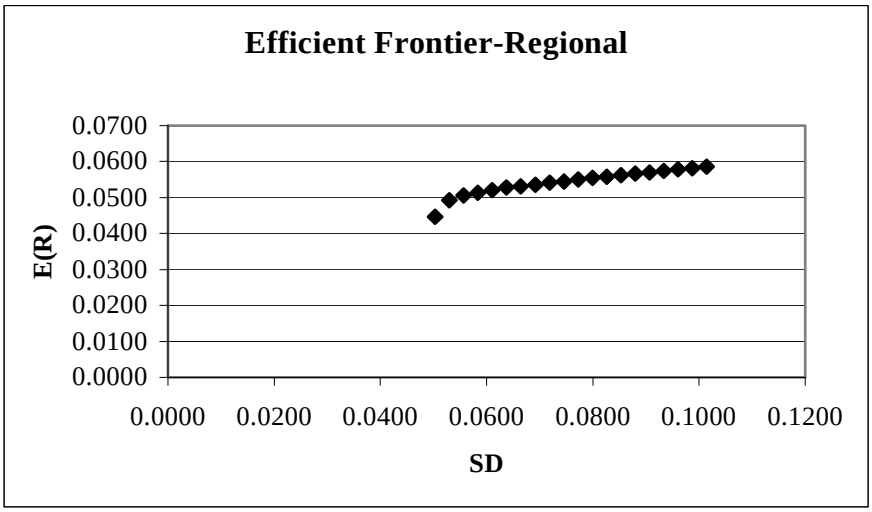

Figure 5: Efficient frontier of regional