

THE ROLE OF RESIDENTIAL PROPERTY IN PERSONAL INVESTMENT PORTFOLIOS: THE CASE OF MALAYSIA

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Keywords: Residential property, housing, personal investment portfolio, portfolio diversification, personal financial planning.

ABSTRACT

Residential property has long been recognised as an important component in a household's overall wealth. The sheer magnitude of purchasing a house has compelled households to commit a disproportionate amount of their funds to own a house, leaving little capital for other kinds of investment. The findings of this study show that an allocation between 50% to 65% of the available capital to residential property, particularly in Terraced houses, in any of the 5 main regions, and with the balance invested in bonds will produce a superior personal investment portfolio, in terms of enhanced risk-adjusted return and significant reduction in the overall risks. Holding a non-diversified portfolio not only produces sub-optimal return, but also exposes households to greater risk which can easily be minimised through mixed-asset portfolio diversification.

INTRODUCTION

Housing has long been perceived by the general public as a form of basic necessity and often, represents the one single largest investment in their personal investment portfolio. According to a study in the US, residential properties represent roughly two-thirds of the household's overall assets (Tracy, Schneider and Chan, 1999).

Besides fulfilling basic needs, owning a house also provides a sense of security and achievement. However, unlike shares, bonds and other financial assets which are often included in the personal investment portfolio and the allocations to these asset classes are methodically determined, residential property has always been singled out and has not been assessed as a component of the portfolio. The segregation of

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residential property from the personal investment portfolio is inconsistent with the modern portfolio theory and the notion of asset integration in standard finance.

Currently, of over 200 managed funds listed in the Unit Trust section (The Star, 2003), none of these funds offer exposure to residential property. Apart from certain specialty funds (i.e. bond funds and cash management funds), most of the managed funds offer investors exposure to various allocation mixes between the two major financial asset classes, namely shares and bonds. It is not uncommon for financial planners in Malaysia to formulate and recommend a personal financial plan by matching one's risk tolerance level and return objectives with a portfolio of managed funds which stage a spectrum of risk-return tradeoffs (through the variations of the allocation between equity and fixed income components). Although housing, be it investment or owner-occupied property, is recognised as an important component in overall personal wealth, the effect and contribution of the residential property to the overall personal asset portfolio is not explicitly acknowledged; hence the allocation to residential property is not being systematically managed.

Thus, the purpose of this paper is to examine the effects and diversification benefits of including residential property in a personal investment portfolio. The findings will provide evidence of whether residential property is a worthwhile investment within a portfolio perspective and how much should be allocated to it. The effect of property type and location will also be examined to determine which property types and regions contribute more towards the improvement of the overall portfolio performance.

LITERATURE REVIEW

Tracy et al (1999) found that in 1995, a typical household in the US had 66% of its total assets in property and only very little portion of the overall assets was in equity (which included indirect equity ownership through pension funds and managed funds). However, the portion of equity rose in the upper half of the wealth distribution, especially the top few percentiles. An earlier but similar study in Japan also reported the same findings where the largest allocation of Japanese household saving was in residential property (in both land and residential structure). The very high cost of housing in Japan was attributed to this high allocation to residential properties (Norland, 1988).

In the same report, Tracy et al (1999) also reported a slight increase in equity share over time, rising 3.5% from 25-year old homeowner to 55-year old homeowner. The persistence of the high property share during this life span was attributed to the trading up process. The higher mortgage payments have cancelled out the income gains that might reduce the property share of a homeowner's portfolio during the prime working years.

The two most significant benefits of owning a house as compared to renting were protection against rental risk and potential capital gain from the sale of a house. On the other hand, the cost of the benefits of homeownership was higher initial outlay on housing, which reduces the funds available for other investments (Boch, Morris and Wyatt, 1986). Additionally, the investment in housing also carries a number of other

risks. The current financing options which do not allow partial ownership, combined with the high leverage used to finance house purchase, had compelled households to commit a disproportionate amount of their funds to the purchase of a house, leaving little capital for other kinds of investment and therefore, leaves the household with a non-diversified portfolio that is highly exposed to regional house price declines (Tracy et al, 1999).

Several proposals have been put forward to ease the burden on the homebuyers. Shiller and Weiss (1999) recommended that metropolitan house price indices be established, allowing households to hedge the risk associated with local housing market declines. Caplin, Chan, Freeman and Tracy (1997) and in a more recent paper by Caplin and Joye (2002) proposed the formation of “housing partnerships”, a financing arrangement that allow a household to share ownership of its home with outside investors. Such partnerships should significantly reduce the up-front costs and the monthly carrying costs of owning a house, enabling families to devote more of their income to other investments.

Holding a non-diversified portfolio will expose individuals to unnecessary non-systematic risk, which can be mitigated through simple portfolio diversification. In standard (or traditional) finance, investors are assumed to construct portfolios consistent with asset integration principles. The focus should not only be on an individual asset’s risk/return characteristics, but how that asset interacts with other portfolio positions. Prospective assets should be chosen by comparing the income distribution resulting from integrating these prospects with the rest of the assets in the portfolio.

Every investment decision should be framed within a portfolio perspective. It is not enough to know the characteristics of a potential investment itself, one must be aware of how an investment impacts the risk and return characteristics of the overall portfolio. Assets are evaluated as to how they might fit into a portfolio that meets the objectives and constraints of the investors (Maginn et al, forthcoming; Bronson et al, forthcoming).

In contrast to standard finance, behavioural finance assumes investors construct portfolios via asset segregation. Instead of evaluating an investment’s impact on the overall portfolio position, investors focus on an asset’s distinct characteristics. Investors tend to evaluate investment options one at a time and not as a part of an aggregate portfolio (Tversky, 1990). Investors build portfolios as pyramids of assets. Each layer carries different attitudes towards risk and are staged to form an investment portfolio (Statman, 1999). This approach is in direct contrast to the Markowitz model.

To be consistent with standard finance theory, residential property, as an asset class, should be evaluated in the light of how it interacts with other assets (i.e. shares and bonds) within the portfolio perspective and how it impacts the overall portfolio performance.

DATA AND METHODOLOGY

Data Sources

Monthly indices of Kuala Lumpur Composite Index (KLSCI) from 1988 to 2002 were obtained from KLSE Daily Diary, while monthly Malaysian Government Securities (MGS) Index (Jan 94 – Dec 01) was collected from the Rating Agency Malaysia. The annual index of the Malaysian House Price Index (MHPI) for the period of 1988 to 2001¹ were provided by the Valuation & Property Services Department.

Due to the limitations of the MHPI, annual returns were used in this paper. Both KLSCI and MGS indices were adjusted to match the cut-off date of MHPI in October each year. Transaction cost was not incorporated in the total return computation and the omission of transaction cost is expected to create an upward bias to the residential property's return. However, as the holding period of an asset increases, the impact of the transaction cost is diminished as the cost is spread over a longer time span, and the investment in residential property, especially owner-occupied house, will be of long-term in nature.

The Malaysian House Price Index

The Malaysian House Price Index is a transaction-based national house price index published by the Valuation & Property Services Department, and is often used to measure the general performance of Malaysian residential property market. The MHPI has more than 60 sub-indices apart from the national and state house price indices. Among these 60 sub-indices, 5 house type sub-indices and 5 region sub-indices were used in the analysis. The house type sub-indices were Terraced, Semi-detached, Detached, High-rise unit and All Houses, whilst the 5 main regions were Klang Valley, Johor Baru, Penang Island, Seremban-Sepang and Ipoh-Kinta. Due to the fact that MHPI is transaction based, appraisal smoothing is not an issue here. However, MHPI traces only the changes in house price, whilst the income component of residential property was not captured by this index. Hence, for total returns analysis, the gross rental returns were derived from Property Market Report (2001) (see Table 1).

Table 1: Rental Return For Residential Property: By Property Type And Region

Property Type	Average Rental	Region	Average Rental
All houses	4.0%	Klang Valley	4.0%
Terraced	5.0%	Johor Baru	3.5%
Semi-detached	4.0%	Penang Island	5.0%
Detached	3.0%	Seremban-Sepang	3.0%
High-rise unit	7.0%	Ipoh-Kinta	2.0%

Source: Authors' compilation from Property Market Report.

¹ The available figures for MHPI were 1988-2001 indices at the time this analysis was carried out, which has limited the study period to year 2001. 2002 MHPI was released very late in 2003, weeks after this paper was written, hence not included in this paper, but will be incorporated in the updated version.

Portfolio Evaluation

According to the asset integration principle, asset should not only be evaluated on an individual basis, but how that asset interacts with other portfolio positions and how the addition of the asset impacts the risk and return characteristics of the overall portfolio. Hence, residential property will be integrated with the financial assets to form a mixed-asset portfolio which will correspond to an average household investment portfolio. Residential property, by property type and by region, will be added to the conventional financial assets portfolio to form a risky portfolio and the diversification gains will be evaluated. Often, due to work and family commitment, it is more sensible for a potential house buyer to consider a certain house type within a region rather than between regions; thus, the effect of integrating residential property by type into the personal investment portfolio is contemplated to be more relevant to an average household.

The first stage of the analysis involves the evaluation of portfolio risk return performance before and after the addition of various residential properties to the financial assets portfolio. In the second stage, efficient frontiers of various portfolio mix will be developed and optimal allocation of each asset will be presented in diagrams. The Solver function (Excel) will be applied to optimise the asset allocation mix to obtain the optimal mixed-asset portfolio that is mean-variance efficient. Risk adjusted return ratio will be used to determine the mixed-asset portfolio performance.

RESULTS AND FINDINGS

The performance of three principal asset classes (bonds, shares and residential properties) and nine residential property sub-classes is presented in Table 2. Bonds have the highest mean return and the best risk-adjusted performance among the principal asset classes. Not surprisingly, shares were the most risky asset class, but the low return was not commensurate with the high risk, which made shares the least preferred investment options on the risk-return basis. The lacklustre performance of shares may be attributed to the relatively short study period in this paper (1989-2001), and the last few years of the study period were clouded by the 1997 Asian financial crisis.

One study found that during stock market decline (crisis), individuals might move into housing, or other durable goods as a replacement for shares (Runkle, 1988). However, Knapp and Nourzad (1994) found the contrary. They found no substitutability between shares and other financial assets, and no evidence that asset holders were willing to substitute between stocks and housing. In fact, it appeared that individuals considered equities to be a requirement in their portfolio, and were not willing to use other assets as substitutes.

In Table 2, among the residential property sub-classes, Terraced houses outperformed all other assets in terms of both absolute return as well as risk-adjusted return. Penang Island was the highest return housing region but the best risk-adjusted performing residential property was in Ipoh-Kinta region.

Table 2: Performance of Various Asset Classes and Sub-classes: 1988 - 2001

	Annual Return	Annual Risk	Risk-return ratio**
Bonds	10.68%	8.58%	1.24
Shares	4.33%	35.28%	0.12
All Houses	10.13%*	9.11%	1.11
Sub-classes (Houses by Type)			
Terraced	10.90%*	6.07%	1.79
Semi-detached	7.87%*	5.66%	1.39
Detached	7.86%*	8.67%	0.91
High-rise Unit	9.41%*	7.22%	1.30
Sub-classes (Houses by Region)			
Klang Valley	9.11%*	8.42%	1.08
Johor Baru (JB)	9.29%*	12.05%	0.77
Penang Island	9.81%*	8.09%	1.21
Seremban-Sepang	7.26%*	5.73%	1.27
Ipoh-Kinta	5.27%*	3.16%	1.67

* Total annual return derived by summing capital return (MHPI) and rental return.

** Defined as return per one unit of risk. Higher ratio denotes higher return per unit of risk.

Tables 3 and 4 present the correlation matrix between the returns of the financial assets and residential property by type and by region. The highest correlation was between Semi-detached houses and Detached houses (0.958), and the correlations between Terraced, Semi-detached and Detached were also very high, all above 0.93. However, the correlations between financial assets and residential properties, either by type or by region, were much lower, especially the correlations between bonds and residential properties. The average correlation between bonds and residential property by type was -0.406 , and -0.462 for residential property by regions. The average correlations between shares and residential property by type and by region were 0.015 and 0.223 respectively. The negative to very low correlations between financial assets and residential properties suggest the existence of possible diversification benefits by integrating these assets to form a mixed-asset portfolio.

Table 3: Correlation Matrix of Various Asset Classes and Property Types: 1988 - 2001

	Bonds	Shares	All Houses	Terraced	Semi-D	Detached	High-rise
Bonds	1.000						
Shares	0.165	1.000					
All Houses	-0.507	0.082	1.000				
Terraced	-0.631	-0.201	0.837	1.000			
Semi-D	-0.338	-0.049	0.837	0.943	1.000		
Detached	-0.476	0.047	0.890	0.933	0.958	1.000	
High-rise Unit	-0.079	0.197	0.365	0.318	0.419	0.348	1.000

Table 4: Correlation Matrix of Various Asset Classes and Property Regions: 1988 – 2001

	Bonds	Shares	Klang Valley	JB	Penang Island	Srbn-Sepang	Ipoh-Kinta
Bonds	1.000						
Shares	0.165	1.000					
Klang Valley	-0.444	0.087	1.000				
JB	-0.459	0.414	0.810	1.000			
Penang Island	-0.588	0.147	0.791	0.895	1.000		
Seremban-Sepang	-0.494	0.028	0.673	0.459	0.253	1.000	
Ipoh-Kinta	-0.323	0.440	0.455	0.559	0.239	0.694	1.000

Table 5 presents the performance analysis of two scenarios. The first scenario corresponds to a pure financial assets portfolio and the second scenario blends both residential property and financial assets to develop a mixed-asset portfolio. The asset allocations for both scenarios were arbitrarily determined with reference to the Tracy et al (1999) report.

Table 5: Mixed-Asset Portfolio Performance – Financial Assets and Residential Properties (by Type and Region)

Scenario 1: 50% Bonds, 50% Shares				
Portfolio Return		Portfolio Risk		Risk-return ratio
7.50%		18.87%		0.40
Scenario 2: 60% Residential Property, 20% Bonds, 20% Shares				
Property Type / Property Region	Portfolio Return	Portfolio Risk	Risk-return ratio	Percentage Improvement*
All Houses	9.08%	9.18%	0.99	149%
Terraced	9.54%	7.23%	1.32	232%
Semi-D	7.72%	7.88%	0.98	147%
Detached	7.72%	8.83%	0.87	120%
High-rise Unit	8.65%	9.28%	0.93	135%
Klang Valley	8.47%	8.91%	0.95	139%
JB	8.57%	11.70%	0.73	84%
Penang Island	8.89%	9.00%	0.99	148%
Seremban-Sepang	7.36%	7.97%	0.92	132%
Ipoh-Kinta	6.16%	8.31%	0.74	87%

* Improvement of the risk-return ratio in Scenario 2 compared to the risk-return ratio in Scenario 1.

As depicted in Table 5, when residential property, either by type of by region, was added to the mixed-asset portfolio, the overall portfolio performance was enhanced

significantly. The most noticeable improvement was seen in the inclusion of Terraced property, whilst most residential property sub-classes also see improvement of over 120%. These findings clearly demonstrate the significance of diversification gain when residential property and financial assets are merged into a portfolio.

Figure 1 presents the efficient frontiers of five mixed-asset portfolios (by property type). The efficient frontiers depicting the mixing of residential properties and financial asset portfolio, has resulted in significant diversification improvement, predominantly in the reduction of the overall portfolio risk, with the most significant reduction in portfolio risk achieved through inclusion of Semi-detached property. Among the five efficient frontiers, the share-bond-terraced portfolio lies above the other efficient portfolios, and hence dominates the other four portfolios.

The optimal asset allocations of these efficient frontiers and risk-adjusted performance were depicted in Figures 2 to 6. With the exception to Figure 3 which shows an increased allocation to Terraced property when moving up the portfolio risk spectrum, all other optimal mixed-asset allocations show diminishing allocations to residential property towards the higher risk end. An important finding of this paper is the substantial improvement of risk-adjusted performance in accord to the increase in the residential property allocations, with only one exception of Terraced property.

The best risk-adjusted performance was found at the minimum-variance-portfolio² of each mixed-asset portfolio (by property type), where the allocations to residential property were between 50% to 65%. This high allocation to residential property is consistent to the norm that housing makes up a large portion of personal investment portfolio for an average household, and in line with the findings of Tracy et al (1999) and Norland (1988).

Among the residential property types, Terraced was the best property type to be included in the mixed-asset portfolio, followed by Semi-detached, Detached and lastly, High Rise unit. Shares have no allocations in most of the efficient portfolios, due to the less performance compared to bonds and residential properties.

Another significant finding of this study was that all minimum-variance portfolios (by property type) outperform the best performing asset, Terraced house, with some of the mixed-asset portfolios outperforming by as much as 200% in terms of risk-adjusted return. This finding is clear evidence that when combining the residential property and financial assets, the diversification gain was substantial. Thus, holding a single asset class portfolio, be it financial asset or residential property, not only induces unnecessary non-systematic risk, but also resulted in sub-optimal investment performance.

Figure 7 presents the efficient frontiers of five mixed-asset portfolios by property region. The optimal asset allocations of these efficient mixed-asset portfolios (by property region) as well as the risk-adjusted performance of each optimal portfolio were depicted in Figure 8 to 12. Similar results were observed when residential

² The (risky) mixed-asset portfolio that has the lowest variance (risk). The minimum-variance portfolio is the portfolio that lies on the lowest left end of the efficient frontier. The first bar on the left in Figure 2 to 6 and 8 to 14 represent the optimal allocations of the minimum-variance portfolio in each mixed-asset portfolios.

property by region, was included in the mixed-asset portfolio. The addition of residential property has resulted in substantial portfolio risk reduction and improved portfolio risk-adjusted performance as the allocation to residential property increased in the optimal portfolio. Again, all the minimum-variance portfolios outperformed the best individual asset (i.e. Terraced), which warrants the merger of residential property and financial assets to form a more diversified portfolio.

In most regions, except for JB, the minimum-variance portfolios suggest the optimum allocation to residential property was between 50% to 80%. Among the five residential property regions, the best region to be included in the mixed-asset portfolio was Seremban-Sepang, followed closely by Ipoh-Kinta, Penang Island and Klang Valley. However, due to the huge initial outlay of purchasing a house coupled with limited personal capital, it is very difficult for an individual to build a truly diversified housing portfolio across property types and regions.

Although shares have zero allocation in most of the efficient mixed-asset portfolios, nonetheless, due to its prominence in the investment portfolio and the potential to generate high return in the future, two efficient portfolios were constructed to reflect the mixture of both financial assets, bonds and shares, and residential property. The allocation to shares was arbitrarily set at a minimum of 10%.

Figure 13 illustrates the optimal allocations of the three-asset portfolio. The result is comparable to the other mixed-asset portfolios, but with lower risk-adjusted return. Yet, the minimum-variance portfolio still outperforms the three principal asset classes, beating the best performing asset, bonds, by 30% in terms of risk-return ratio.

Similar results were found in Figure 14 when the best performing property type (Terraced) was added to the financial assets portfolio. Although the 10% allocation to shares has an adverse effect on the mixed-asset portfolio, however, the risk-adjusted performance of the portfolio was still superior to other individual assets.

CONCLUSIONS AND RECOMMENDATIONS

Housing, or residential property, has long been recognised as an important component in overall personal wealth. The sheer magnitude of purchasing a house has compelled households to commit a disproportionate amount of their capital to the house, leaving little resources for other kinds of investment. The findings of this study support the view that housing represents a large portion of household investment portfolio. Terraced houses were one of the best performing assets in the study period, but putting all funds in a single asset has resulted in sub-optimal performance.

The results show that an allocation between 50% to 65% of a total investable fund to residential property, particularly in a median Terraced house, in any of the 5 main regions, and the remainder invested in bonds and shares (if one is comfortable with the risk assumed), will create a more superior personal investment portfolio, both in terms of higher risk-adjusted return and extensive reduction in overall risks.

Due to indivisibility and large initial outlay of acquiring a house, it is very difficult for individuals to possess a truly diversified residential property portfolio. However, the

findings do provide suggestions on the optimal asset allocations between residential property and financial assets, and the preferred house type and regions, which should help in making the personal investment decisions.

Another question one might raise is “how to create a diversified portfolio if I just have enough capital to buy a house?” A simple answer to that question is, buy a less expensive house, and you will have surplus funds to invest in other assets, subsequently forming a diversified mixed-asset portfolio.

The findings of this study have demonstrated the importance of integrating residential property into the personal investment portfolio consideration. Hence, individuals should systematically allocate their limited resources into various asset classes at a targeted proportion to achieve a well-diversified portfolio.

Cash or cash equivalents were not incorporated in this analysis due to the fact that it was deemed as a risk-free asset, hence not included in the risky asset portfolio analysis. According to the separation theorem, the portfolio choice decisions were separated into two independent tasks; determination of the optimal risky portfolio, and the allocation between risky portfolio and risk-free asset which greatly depends on the personal preference and risk tolerance. Hence, once the optimal risky portfolio is determined, individuals can fine-tune their personal investment portfolios by matching their objectives and constraints along the line between the risk-free asset and the optimal risky portfolio.

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