

THE ROLE OF INTERNATIONAL PROPERTY TRUSTS IN AUSTRALIAN MIXED-ASSET PORTFOLIOS

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ABSTRACT

As more LPTs invest overseas, the percentage of international property in LPTs has expanded to over 30% of the total LPTs market value. This development has offered new investment opportunities to Australian investors, especially smaller fund managers, to gain exposure of indirect international property investment. Findings of this paper suggest that the addition of international LPTs to the Australian mixed-asset portfolio has resulted in significant diversification gain. The diversification benefit is even more remarkable when direct property is included in the mixed-asset portfolio. Even when the allocations to international LPTs and direct property were constrained, the international LPTs, property and financial assets' portfolio still outperformed other mixed-asset portfolios.

Keywords: International property trust, listed property trusts (LPTs), diversification, mixed-asset portfolio.

INTRODUCTION

The issues of international property diversification and the role of international property in the mixed-asset portfolio have received much attention and are well documented in media and literatures. Recent ventures into international property investments by several Australian property trusts have revealed the significance of and demand for international property by Australian investors. Among the recent international acquisitions and expansions are Macquarie CountryWide Trust, Colonial First State Property and Westfield Holdings; as well as the expected launching of two new US retail trusts in Australia, Galileo America Trust and Macquarie DDR, later this year.

The increased interest in international property investment through property trusts can be seen from the significant increase in the number as well as the weight of international property in LPTs portfolio. In June 1997, only 1 out of 53 LPTs had international property investment, which represented about 5% of total LPTs market capitalisation (PIR, 1997; Tan, 2003). In March 2003, the number of LPTs that invested internationally has increased to 7 (out of 33 LPTs) and the percentage of international property investment has expanded to over 30% of the total LPTs market value (PIR, 2003; Stuckey, 2003).

Factors such as geographical, political and economic diversification; lack of local opportunities for property investment; substantial growth in available investment funds; favourable exchange rate and interest rate differentials; and greater array of investment choices were attributed to the increased interest in international property investment (Newell and Worzala, 1995; Worzala and Newell, 1997). Increased recognition of property, attractive risk-return profile, and growing demand for pension fund asset/liability management has also warranted increased allocations to international property (Steinert and Crowe, 2001). However, international property investment also raises the concern of uncertainty in currency exchange rate, ongoing management and operation problems, taxation differences and political uncertainty, increased transaction costs, lack of local expertise, and cultural and language differences (Worzala and Newell, 1997).

LITERATURE REVIEW

The role of direct property in multi-asset portfolio is well documented. In one of the earliest studies on direct property as a separate asset class in mixed-asset portfolio, Webb et al (1988) found that not only property should be included in mixed-asset portfolio, but also approximately two-third of the investment wealth should be allocated to property. Subsequent studies by Hamelink and Hoesli (1996), Rubens et al (1998), Stevenson (1999), and Byrne and Lee (1997 & 1999) also confirmed that the mixed-asset portfolio containing direct property and financial assets always dominated the financial assets portfolio. However, when the property data were desmoothed to take into account appraisal bias, the diversification gain was reduced.

Despite the encouraging findings of property in the mixed-asset portfolio, Chun and Shiling (1998) found that most institutional investors i.e. life insurance companies, in Australia, Austria, Belgium, France, Italy, the Netherlands, Spain, Sweden, the UK and US have shifted out of property assets and into stocks and bonds during 1986-96.

Theoretically, if economies are not completely integrated, then property returns in different countries will not move together, and further risk reduction can be attained through international diversification. As a result, an internationally diversified portfolio will have lower risk than those that are diversified just among domestic property assets.

Studies by Webb et al (1988), Chua (1999), Stevenson (1999), Addae-dapaah and Yong (2000), Steinert and Crowe (2001), and Conover, Friday and Sirmans (2002) all confirmed the significance of international property in the efficient mixed-asset portfolios. Even though investing in overseas property would assume additional risks, additional portfolio diversification was also attained (Newell and Webb, 1996). However, Cheng et al (1999) found that international property was unlikely to produce significant diversification benefits and suggested that investors shouldn't allocate more than 10% in international property, and 5% or less for investors with a low risk tolerance.

Due to the fact that direct property cannot be perfectly diversified, indirect property or property securities can be employed by investors to reduce their levels of risk in

property investment (De Wit, 1997). Studies on the characteristics of indirect property confirmed that direct and indirect properties were different from each other (Seiler et al, 1999, and Chiang and Lee, 2002), and including indirect property in a multi-asset portfolio would enhance the diversification benefit (Liang and McIntosh, 1998). Although direct and indirect property should be considered as two separate asset classes, Newell et al (2000) found that property securities had taken on more of the features of direct property than the stock market, and this trend was clearly seen for the UK property shares, USA REITs and Australian LPTs in recent years.

Differences in property securities' performance over continents (Eichholtz and Koedijk, 1996), low correlation between property shares in emerging and developed markets (Barry et al, 1996), lower internationally correlated property share returns than common stock and bond returns (Eichholtz, 1996), lower correlations among regional property share markets (Eichholtz, 1997), and weak international dependence of national property markets (Eichholtz et al, 1998) have validated the inclusion of international property securities in property portfolios to achieve a more efficient property portfolio.

In addition, no long run co-integration relationship was observed between domestic property and equity markets among the USA, UK and Australia property markets (Wilson and Okunev, 1996 & 1999), and in the Asia Pacific region (Garvey et al, 2001). These results supported the belief that property investors would benefit from diversifying out of an all-domestic portfolio into an internationally diversified portfolio.

Gordon et al (1998), and Maurer and Reiner (2002) observed significant diversification benefits for including international property securities in the mixed-asset portfolio and the diversification benefit was even more significant for low to medium risk portfolios. The source of diversification gains was mainly in risk-reduction. Liu and Mei (1998) also found that international property-related securities provided incremental diversification benefits over and above that associated with international stocks. These benefits were relatively more pronounced at lower risk-return levels of the optimal portfolios and were present regardless of whether currency risks were hedged.

Despite the vast body of evidence in portfolio performance enhancement through international property diversification, be it direct or indirect property, some institutional investors have not diversified internationally in the property sector because they are simply too small in global terms. Factors such as high costs of diversification and eliminating unsystematic risk, high transaction costs of researching market and problems of liquidity and day-to-day management have deterred small funds to diversify internationally (McAllister, 1999).

Pooled international property investment vehicles such as property trusts have emerged to cater for the demand for international property exposure from the smaller investors/funds. The development of these international property trusts would facilitate international property investment (Steinert and Crowe, 2001; Tan, 2003). Although not perfect substitution for direct international property investment, international property trusts have provided a means for investors to include international property in their portfolio to harvest the benefits of international

property diversification without being overwhelmed by the high costs and uncertainty associated with direct international property investment. Thus, the objective of this paper is to examine the diversification benefits of including international property trusts, as a separate asset class, in the Australian mixed-asset portfolio.

DATA AND METHODOLOGY

Data Sources

Quarterly total return data of Australian Composite Property, All Ordinaries Index, Bonds (all maturities) and ASX/LPT 300 Index were obtained from PCA quarterly report (PCA, 2003), while total returns and market capitalisations of international LPTs¹(ILPTs) were provided by UBS Warburg for a period from June 1997 to March 2003 (UBS Warburg, 2003). Details of each international LPTs were extracted from PIR's Annual Listed Real Estate Review 1998 – 2003, and depicted in Table 1.

Table 1: Profile of International LPTs

ILPT	Sector	Market Capitalisation ¹ (\$ million)	First international property added to trust portfolio in	No. of international properties	Country/ location of international property
Westfield America (WFA)*	Ret.	5,857	June 1996	63	USA
Lend Lease US Office (LUO)*	Com.	694	Dec 1999	9	USA
Macquarie ProLogis (MPR)*	Ind.	476	June 2002	67	USA/Mexico
Macquarie Country Wide (MCW)	Ret.	760	October 2000	20+17	USA/New Zealand
Westfield Trust (WFT)	Ret.	7,145	December 1998	11	New Zealand
Macquarie Goodman Industrial (MGI)	Ind.	1,430	July 2001	3	New Zealand
AMP Diversified Property (ADP) ²	Ind.	1,543	September 2002	1	New Zealand

* International LPTs that have 100% international property in trusts portfolio.

¹ As at 31 March 2003

² Acquired by Stockland in July 2003.

Source: Author's compilation from UBS Warburg and PIR report.

International Property Trust Index

Even though international property has accounted for over 30% in the overall LPTs capitalisation (Stuckey, 2003), there is no published index tracking this sector and that complicates the benchmarking and performance evaluation for international LPTs.

¹ International LPTs are referred to Australian LPTs that have international property in their trusts portfolio.

Currently, there are several LPT indices maintained/published by the Australian Stock Exchange (ASX) and UBS Warburg. The S&P/ASX 300 Property Accumulation Index (ASX/LPT 300) contains 30 property trusts listed on the Australian Stock Exchange. UBS Warburg has subdivided these 30 LPTs into 6 major sub-sector indices, which are UBS-W Leaders 300, UBS-W Diversified 300, UBS-W Retail 300, UBS-W Commercial 300, UBS-W Industrial 300, and UBS-W Hotel 300. The number of constituents for each sub-sector indices ranges from the lowest 2 for hotel sub-sector index to the highest 8 for retail and commercial sub-sector indices (PIR, 2003).

To complement the existing LPT sub-sector indices, two international property trusts indices were developed by Tan (2003). The first international LPT index encompassed all LPTs that have international property investments, i.e. both 100% international LPTs and merged domestic-international property LPTs. Due to the fact that international property performance in the merged domestic-international LPTs was not directly observable, the contribution of the international property component was assumed to be proportionate to its weight in the merged domestic-international LPTs portfolio. However, this methodology has a number of shortcomings, such as the returns from international property and domestic property in the same merged domestic-international LPT will be perfectly correlated (+1.0), and replicating this international LPT index is impossible without committing to both international and domestic component of merged domestic-international LPTs at the same time.

The second international LPT index, which was more straight forward and used only 100% international LPTs, was constructed to complement the first international LPT index. The second methodology was free from the prior criticisms but has reduced the number of index constituents. Also, the performance of international property in the merged domestic-international LPTs was not accounted for in the index.

For the purpose of this paper, the second method, which only use 100% international LPTs, was employed to extend the international LPT index to March 2003. Although only three international LPTs were used in the construction of this international LPT index, but the index was deemed to be representative as the value of the three 100% international LPTs was accounted for over 80% of the overall international property value in LPTs.

De-smoothed Property Data

The appraisal-based direct property index has been criticized to be smoother than the actual transaction figures. The effect of appraisal-smoothing will reduce the volatility of the property return series thus resulting in biased risk-adjusted performance. Several studies have resolved to this issue and suggested risk adjustment of 30% to 80% to better reflect the real volatility of appraisal-based property return series (Webb and Rubens, 1988; Geltner, 1991; Newell and MacFarlane, 1995; Newell and Webb, 1996).

The return series of Australian Composite Property Index will be de-smoothed applying the following equation (as described in Newell and MacFarlane, 1994 & 1995):

$$\text{Adjusted annual risk} = 4 \text{ quarterly risk} (1 + \frac{1}{2})^3 (1 + \frac{1}{2} \sum_{i=1}^4 \sum_{j=1}^4 \rho_{ij}), \quad i < j$$

where:

\bar{r} = average quarterly return, and

ρ_{ij} = correlation between quarter i and j returns.

Portfolio Diversification Evaluation

Mixed-asset portfolio will be constructed using ex-post data to evaluate the diversification benefits of adding international property trusts and direct property to conventional financial assets portfolio. The analysis will be carried out in two stages. The first stage involves the evaluation of mixed-asset portfolio's performance when direct property (proxy by Australian Composite Property Index), LPTs (proxy by ASX/LPT 300 Index) and international LPTs (proxy by ILPT Index) are added to financial assets portfolio. The second stage extends the portfolio analysis by comparing the efficient frontiers of a variety of asset mixes based on Markowitz Modern Portfolio Theory. Solver function (in Excel) will be applied to optimise the asset allocation mix to obtain the optimal mixed-asset portfolio that is mean-variance efficient. The diversification benefit of international LPTs can be established if the efficient frontier of international LPTs portfolio dominated other efficient frontiers that did not include international LPTs.

RESULTS AND DISCUSSION

The performance of various asset classes over the period from June 1997 to March 2003 is presented in Table 2. International LPTs outperformed all other asset classes in terms of absolute return, but also had the highest risk. A few factors might have contributed to the high risk-high return attributes of the international LPTs. In general, the average leverage ratio of the LPTs sector is 28.4% but the average leverage for the three 100% international LPTs is 47.5% (PIR, 2003a). Moreover, during the study period, the exchange rate was in favour of Australian investors. Small number of the international LPT index constituents and heavy reliance in one of the international LPTs also contributes to the high volatility of the international LPT index. However, although the numbers of international LPTs currently in this international-LPT index are small, this is expected to increase significantly in the next two years as more LPTs² in Australia seek international property investment opportunities.

Direct property has stood out as the best performing asset class in terms of risk-adjusted performance, even with increased risk after adjustments for appraisal bias. The desmoothing of property index has imposed a 32% upward adjustment to the property risk estimates and this adjustment is in line with the suggested ranges reported in Newell and MacFarlane (1995), and Newell and Webb (1996).

² Principal Financial Group plans to list a substantial portfolio of US office buildings (and also targeting Asia property) on the ASX; launching of Galileo America Trust and Macquarie DDR.

Table 2: Performance of Various Asset Classes (June 97 – March 03)

	Property	Shares	Bonds	LPTs	ILPTs
Annual Return	10.21%	4.52%	6.62%	11.11%	18.72%
Annual Risk	0.66%	12.37%	4.17%	7.87%	13.04%
Adjusted Risk	0.87%*				
Sharpe Ratio	7.55	-0.06	0.33	0.74	1.03
Adjusted Sharpe Ratio	6.23**				

* Desmoothed property risk

** Desmoothed property risk is used in the computation.

Figure 1 depicts the indices of various asset classes for the period between June 1997 and March 2003. The outperformance of international LPTs was clear when compared to other asset indices. The smooth upward trend of property index also explained the very low return volatility of direct property as reported in Table 2.

Table 3: Performance of Various Asset Classes (1984 – 2002)

	Property	Shares	Bonds	LPTs
Annual Return	10.03%	12.57%	11.18%	12.32%
Annual Risk	9.78%	19.75%	7.70%	10.61%
Sharpe Ratio	0.12	0.19	0.30	0.32

When the international LPTs which constrained the study period to 1997-2003 were excluded, the performance analysis of other asset classes could be extended to 18 years series (1984 to 2002). When the longer time series were used (Table 3), the direct property no longer outperformed other asset classes and financial assets were not as lacklustre as they were in 1997-2003 period. However, the performance of LPTs still outshined shares and bonds in both study periods.

Table 4: Correlation Matrix of Various Asset Classes (June 97- March 03)

	Property	Shares	Bonds	LPTs	ILPTs
Property	1				
Shares	0.220	1			
Bonds	-0.020	-0.587	1		
LPTs	0.002	0.098	0.384	1	
ILPTs	-0.154	0.148	0.285	0.806	1

Table 4 presents the correlation matrix between the returns of the asset classes. The highest correlation was between LPTs and international LPTs. This is understandable since international LPT is part of the broader LPTs. However, the very low correlation between shares and bonds is surprising. But, when take into consideration the shift of capitals from the ailing equity market to the fixed-income assets around

the turn of the millennium, and the recent reversal of the capital flow, the low negative correlations between shares and bonds seems comprehensible. The correlations between international LPTs and other asset classes, except for LPTs, were below 0.30. On average, the correlations between various asset classes were very low, averaging 0.11. The low correlations imply the existence of possible diversification benefits for the mixed-asset portfolio.

Table 5: Correlation Matrix of Various Asset Classes (1984 - 2002)

	Property	Shares	Bonds	LPTs
Property	1			
Shares	-0.023	1		
Bonds	-0.206	0.293	1	
LPTs	-0.123	0.556	0.596	1

Over a longer period, the correlations among various assets were quite different when contrasting Table 4 to Table 5. In the long run, direct property was negatively correlated with shares, bonds and LPTs, while shares and bonds were positively correlated. The correlation between LPTs and shares were much higher than those of LPTs and property, suggesting LPTs and shares were more alike than LPTs and property. The shift in correlations of these assets may due to variations in study periods or fundamental structural change. However, in order to determine the main cause of these changes, further research is required, which is not within the scope of this paper.

Tables 6 to 9 present the various portfolio mix scenarios and performance analysis for the period from June 1997 to March 2003. The allocations to financial assets were set arbitrarily with varying allocations to property, LPTs and international LPTs.

Table 6: Mixed-Asset Portfolio Performance – Financial Assets and Direct Property

Shares	Bonds	Cash	Property	Portfolio Return	Portfolio Risk	Risk-Return Ratio
50%	40%	10%	0	4.91%	6.17%	1.26
47.5%	37.5%	10%	5%	5.14%	5.86%	1.14
45.0%	35.0%	10%	10%	5.37%	5.56%	1.03
42.5%	32.5%	10%	15%	5.60%	5.25%	0.94
40.0%	30.0%	10%	20%	5.84%	4.94%	0.85
37.5%	27.5%	10%	25%	6.07%	4.63%	0.76
35.0%	25.0%	10%	30%	6.30%	4.33%	0.69

To be consistent with the findings of other studies (Ziobrowski et al, 1997; and Craft, 2001), the maximum allocation to direct property was capped at 30%. It is apparent that as the property allocations were increased at the expense of proportional reduction in shares and bonds allocations, portfolio performance improved

significantly (see Table 6). The risk-return ratios declined from 1.26 to less than 0.70 as the allocations to property were raised from zero to 30%.

Table 7: Mixed-Asset Portfolio Performance – Financial Assets, Direct Property and LPTs

Shares	Bonds	Cash	Property	LPTs	Portfolio Return	Portfolio Risk	Risk-Return Ratio
35.0%	25.0%	10%	30%	0%	6.30%	4.33%	0.69
35.0%	25.0%	10%	25%	5%	6.35%	4.36%	0.69
35.0%	25.0%	10%	20%	10%	6.39%	4.42%	0.69
35.0%	25.0%	10%	15%	15%	6.43%	4.52%	0.70
35.0%	25.0%	10%	10%	20%	6.48%	4.66%	0.72
35.0%	25.0%	10%	5%	25%	6.52%	4.82%	0.74
35.0%	25.0%	10%	0%	30%	6.57%	5.01%	0.76

Table 7 presents a scenario where the allocation to property and LPTs was capped at 30% with varying proportions of property and LPTs. This was to simulate the effect of replacing direct property with LPTs. As reported by Stuckey (2003), the allocation to direct property in Australian superannuation funds had decreased from 14% in 1998 to 2% in 2002. In the same period, allocation to LPT had increased from 3% to 7%, indicating the trend of increase holding of LPTs by offloading direct property.

The findings show as the level of LPTs' allocation was increased by reducing investment in direct property, the portfolio return was enhanced but at the expense of greater risk, resulting in a decline of risk-adjusted performance.

Although not perfectly comparable, the diversification gains by adding LPTs to the mixed-asset portfolio is consistent with the findings of Ibbotson (2001) and Newell and Tan (2003).

Table 8: Mixed-Asset Portfolio Performance – Financial Assets, Direct Property and International LPTs

Shares	Bonds	Cash	Property	ILPTs	Portfolio Return	Portfolio Risk	Risk-Return Ratio
35.0%	25.0%	10%	30%	0%	6.30%	4.33%	0.69
35.0%	25.0%	10%	25%	5%	6.73%	4.40%	0.65
35.0%	25.0%	10%	20%	10%	7.15%	4.57%	0.64
35.0%	25.0%	10%	15%	15%	7.58%	4.83%	0.64
35.0%	25.0%	10%	10%	20%	8.00%	5.15%	0.64
35.0%	25.0%	10%	5%	25%	8.43%	5.54%	0.66
35.0%	25.0%	10%	0%	30%	8.85%	5.97%	0.67

In Table 8, LPTs was replaced by international LPTs in the mixed-asset portfolio. As the allocation to international LPT was lifted, portfolio's return improved substantially. Moreover, the best risk-adjusted performance, among all combinations across 4 scenarios (see Table 6 – 9), was witnessed at the level of 10%-20% allocation to direct property and international LPT.

Table 9: Mixed-Asset Portfolio Performance – Financial Assets and International LPTs

Shares	Bonds	Cash	ILPTs	Portfolio Return	Portfolio Risk	Risk-Return Ratio
50%	40%	10%	0%	4.91%	6.17%	1.26
47.5%	37.5%	10%	5%	5.57%	5.93%	1.07
45.0%	35.0%	10%	10%	6.22%	5.77%	0.93
42.5%	32.5%	10%	15%	6.88%	5.69%	0.83
40.0%	30.0%	10%	20%	7.54%	5.70%	0.76
37.5%	27.5%	10%	25%	8.20%	5.79%	0.71
35.0%	25.0%	10%	30%	8.85%	5.97%	0.67

Table 9 presents the performance of the mixed-asset portfolio with international LPTs. As the allocation to international LPTs increased, the mixed-asset portfolio return was augmented from below 5% to nearly 9% with the maximum risk reduction recorded at the 15% allocation level. Overall, the risk-adjusted performance of the portfolio has improved significantly from 1.26 to 0.67, which was the greatest improvement seen across the four scenarios.

By and large, these findings have demonstrated the significance in diversification gain by adding property, LPTs and international LPTs to the financial assets portfolio. The most noticeable improvement was the addition of international LPTs to pure financial assets and mixed property-financial assets portfolios. These findings are in line with similar studies in the US and UK (Webb et al, 1988; Gordon et al, 1998; Chua, 1999; Stevenson, 1999; and Maurer and Reiner, 2002).

Figure 2 presents the efficient frontiers of four mixed-asset portfolios. The addition of another asset class to the financial assets portfolio, be it property, LPTs or international LPTs, has resulted in significant diversification improvement. When property was added to shares/bonds portfolio, the portfolio risk has declined substantially coupled with enhanced portfolio return. When LPTs and international LPTs were added to the mixed-asset portfolios, not only the efficient frontiers were elevated to a higher level, but also the efficient sets also spanning across a wider risk spectrum. Between LPTs and international LPTs, the mixed-asset portfolio with international LPTs consistently outperformed the LPTs portfolio at all levels of risk/return spectrum except at the lower end. This finding is consistent with the findings of Gordon et al (1998), Maurer and Reiner (2002) and Liu and Mei (1998); where significant diversification benefits were found when international property securities were added to the portfolio.

When one examines closely the locus of the four efficient frontiers in Figure 2, it was apparent that the shares/bonds/property mixed-asset portfolio became the dividing point of the whole diagram, where only those portfolios lied on the upper section of the graph were truly efficient in terms of mean-variance, thus should dominate all other portfolios.

By linking the two optimum portfolios in the upper section (as depicted in Figure 3), a whole new efficient frontier emerged and dominated all other portfolios. The constituents of this optimal portfolio included shares, bonds, property and international LPTs as suggested by the diagram in Figure 3. This finding was in line with the results reported in Table 8 where the best risk-adjusted performance was achieved by the property/international LPT/shares/bonds mixed-asset portfolio.

Figure 4 presents the optimal asset allocations of the 4-asset (shares/ bonds/ property/ international LPTs) portfolio. Due to relatively poor performance in 1997-2003 period, shares had no allocation in this optimal portfolio. Direct property dominated the lower risk region of the portfolio and was substituted by international LPTs when moving up the portfolio risk spectrum. However, one should be cautious before jumping into conclusion that assets such as shares, bonds and LPTs have no place in the efficient portfolio as the 2-asset (direct property and international LPTs) portfolio outperformed all other portfolio mixes. Factors such as small sample bias as well as short study period (6 years) should be taken into consideration, as depicted by the significant differences in assets' performance and inter-asset correlations between two study periods in Table 2-3 and Table 4-5.

To better reflect the industry practice, the allocation to direct property was controlled at a maximum of 20% and 10% for international LPTs. The constrained 4-asset portfolio efficient frontier is presented in Figure 5 and the optimal allocations are presented in Figure 6.

Even though the constrained 4-asset portfolio was less efficient compared to the unconstrained portfolio, but it still dominated other mixed-asset portfolios (shares/bonds; shares/bonds/LPTs; shares/bonds/ILPTs) with significant lower risk given the same level of return (see Figure 5). Yet when capped at 10% allocation, international LPT had demonstrated its important role in the mixed-asset portfolio, with most significant contributions to diversification benefits came in at the higher end of the risk levels.

PROPERTY INVESTMENT IMPLICATIONS AND CONCLUSIONS

Australian LPTs make up 8% of the entire world's listed property and over 55% of domestic investment grade property was held in LPTs (ASX, 2002; Steinert and Crowe, 2001). Lack of local investment choices and need for diversification have driven Australian LPTs to venture out of domestic market to seek property investment opportunities. As more LPTs invest internationally, this development has offered new investment options to Australian investors, especially smaller fund managers who have no resources and expertise to invest directly in international property, to gain international property investment exposure for their investment portfolios.

The findings of this paper suggest that the addition of international LPTs in the Australian mixed-asset portfolio had resulted in significant diversification gains. The diversification benefit was even more remarkable when direct property was included in the mixed-asset portfolio. Even when the allocations to international LPTs and direct property were constrained at 10% and 20% level respectively, the 4-asset (shares/ bonds/ property/ international LPTs) portfolio still outperformed other mixed-asset portfolios.

The issue of currency risk goes hand in hand with international property investment. According to Grinold and Meese (2000), it was not uncommon for investors to determine their strategic investment policy without consideration of the costs and benefits of currency hedging. This practise had led to biases in the allocation such as lesser international investment and less of the international investment was hedged.

By and large, international LPTs have some sort of currency hedging policies and mechanisms in place. Moreover, investment transaction proceeds as well as dividends are paid in local currency, thus, by investing in these international LPTs, domestic investors are fully hedged for currency risk.

Even though the numbers of international LPTs currently in this international LPTs analysis are small, this is expected to increase significantly in the next two years as more LPTs in Australia seek international property investment opportunities. By the end of 2003, with two new entrants³, the number of international LPTs will increase to 9 with 5 have 100% international property portfolio. This figure is comparable to the two largest LPT sub-sectors, diversified and commercial. As such, this international LPTs sector will take on enhanced stature for ongoing portfolio investment analysis.

REFERENCE

- Australian Stock Exchange. 2002. Property Trusts Summary: Listed Property Trusts. ASX: Australia.
- Addae-Dapaah, K. and Yong, C. 2000. Diversification of Real Estate Investment in the Asia-Pacific Region. Pacific Rim Property Research Journal. Vol. 6, No. 2, 31-45.
- Barry, C., Rodriguez, M. and Lipscomb, J. 1996. Diversification Potential from Real Estate Companies in Emerging Capital Markets. Journal of Real Estate Portfolio Management. Vol. 2, No. 2, 107-118.
- Byrne, P. and Lee, S. 1999. The Place of Property in an Australian Multi-Asset Portfolio: A Comparison of MPT and MAD Optimisation Methods. Australian Land Economics Review. Vol. 5, No. 1, 21-28.

³ Galileo Shopping America Trust was launched in September 2003. Macquarie DDR with a portfolio of US shopping centres will put into market soon.

- Byrne, P. and Lee, S. 1997. Real Estate Portfolio Analysis under Conditions of Non-Normality: The Case of NCREIF. *Journal of Real Estate Management*. Vol. 3, No. 1, 37-46.
- Calder, S. 2002. Offshore Investment Opportunities. *BT Real Estate Fund Management: Australia*.
- Cheng, P., Ziobrowski, A., Caines, R. and Ziobrowski, B. 1999. Uncertainty and Foreign Real Estate Investment. *Journal of Real Estate Research*. Vol. 18, No. 3, 463-479.
- Chiang, K. and Lee, M. L. 2002. REITs In The Decentralized Investment Industry. *Journal of Property Investment and Finance*. Vol. 20, No. 6, 496-512.
- Chua, A. 1999. The Role of International Real Estate in Global Mixed-Asset Investment Portfolios. *Journal of Real Estate Portfolio Management*. Vol. 5, No. 2, 129-137.
- Chun, G.J. and Shiling, J.D. 1998. Real Estate Asset Allocations and International Real Estate Markets. *Journal of Asian Real Estate Society*. Vol. 1, No. 1. 17-44.
- Conover, M., Friday, S. and Sirmans, G. 2002. Diversification Benefits From Foreign Real Estate Investments. *Journal of Real Estate Portfolio Management*. Vol. 8, No. 1, 17-26.
- Craft, T. 2001. The Role of Private and Public Real Estate in Pension Plan Portfolio Allocation Choices. *Journal of Real Estate Portfolio Management*, Vol. 7, No. 1, 17-23.
- De Wit, D. 1997. Real Estate Diversification Benefits. *Journal of Real Estate Research*. Vol. 14, No. 1/2, 117-135.
- Eichholtz, P. 1996. Does International Diversification Work Better for Real Estate than for Stocks and Bonds? *Financial Analysts Journal*. Jan-Feb, 56-62.
- Eichholtz, P. and Koedijk, K. 1996. The Global Real Estate Securities Market. *Real Estate Finance*. Spring, 76-82.
- Eichholtz, P. 1997. How To Invest Internationally? Region And Property Type On A Global Scale. *Real Estate Finance*. Fall, 51-56.
- Eichholtz, P., Huisman, R., Koedijk, K. and Schuin L. 1998. Continental Factors in International Real Estate Returns. *Real Estate Economics*. Vol. 26, No. 3, 493-509.
- Garvey, R., Santry, G. and Stevenson, S. 2001. The Linkages Between Real Estate Securities in the Asia-Pacific. *Pacific Rim Property Research Journal*. Vol. 7, No. 4, 240-258.
- Geltner, D. 1991. Smoothing in Appraisal-Based Return. *Journal of Real Estate Finance and Economics*. Vol. 4, 327-345.

Gordon, J., Canter, T. and Webb, J. 1998. The Effect of International Real Estate Securities on Portfolio Diversification. *Journal of Real Estate Portfolio Management*. Vol. 4, No. 2, 83-91.

Hamelink, F. and Hoesli, M. 1996. Conditional Heteroscedasticity And Real Estate In Diversified Portfolios: An Application Of The QTARCH Methodology. *Journal of Property Research*. Vol. 13, 17-30.

Ibbotson Associates. 2001. REIT's Low Correlation To Other Stocks And Bonds Is Key Factor For Portfolio Diversification. *National Association of Real Estate Investment Trusts*.

Liang, Y. and McIntosh, W. 1998. REIT Style and Performance. *Journal of Real Estate Portfolio Management*. Vol. 4, No. 1, 69-78.

Liu, C. and Mei, J. 1998. The Predicability Of International Real Estate Market, Exchange Rate Risks And Diversification Consequences. *Real Estate Economics*. Vol. 26, No. 1, 3-39.

McAllister, P. 1999. Globalisation, Integration and Commercial Property, Evidence from the UK. *Journal of Property Investment and Finance*, Vol. 17, No. 1, 8-26.

Maurer, R. and Reiner, F. 2002. International Asset Allocation with Real Estate Securities in a Shortfall Risk Framework: The Viewpoint of German and U.S. Investors. *Journal of Real Estate Portfolio Management*. Vol. 8, No. 1, 27-43.

Newell, G., Lee, S., Baum, A. and Acheampong, P. 2000. The Level of Direct Property in UK Property Company Performance. *Royal Institution of Chartered Surveyors "The Cutting Edge 2000" Conference paper*.

Newell, G. and MacFarlane, J. 1994. Property: More Volatile Than You Thought. *Journal of Australian Securities Institute*, March, 25-37.

_____ 1995. Improved Risk Estimation Using Appraisal-Smoothed Real Estate Return. *Journal of Real Estate Portfolio Management*. Vol. 1, No. 1, 51-57.

Newell, G. and Tan, Y. K. 2003. Property Trust's Enhance Their Portfolio Diversification Benefits. *Monthly Report February 2003, Property Investment Research*.

Newell, G. and Worzala, E. 1995. The Role of International Property in Investment Portfolios. *Journal of Property Finance*. Vol. 6 No. 1, 55-63.

Newell, G. and Webb, J. 1996. Assessing Risk for International Real Estate Investments. *Journal of Real Estate Research*. Vol. 11, No. 2, 103-115.

Property Council of Australia. 2003. Investment Performance Index: March 2003. PCA: Sydney.

Property Investment Research. 2003(a). Monthly Report August 2003 (and miscellaneous 1998-2003 copies). PIR: Melbourne.

Property Investment Research. 2003(b). Annual Listed Property Trust Review 2003 (and miscellaneous 1998-2002 copies). PIR: Melbourne.

Rubens, J. H., Louton, D. A. and Yobaccio, E. 1998. Measuring the Significance of Diversification Gains. *Journal of Real Estate Research*. Vol. 16, No. 1, 73-86.

Seiler, M., Webb, J. and Myer, F. 1999. Are EREITs Real Estate? *Journal of Real Estate Portfolio Management*. Vol. 5, No. 2, 171-181.

Steinert, M. and Crowe, S. 2001. Global Real Estate Investment: Characteristics, Portfolio Allocation and Future Trends. *Pacific Rim Property Research Journal*. Vol. 7, No. 4, 223-239.

Stevenson, S. 1999. Real Estate's Role in An International Multi-Asset Portfolio: Empirical Evidence Using Irish Data. *Journal of Property Research*. Vol. 16, No. 3, 219-242.

Stuckey, S. 2003. Global Outreach of Australian Property Investors – The Story So Far. Property Council of Australia “Property & Capital Markets Seminar” Seminar Paper.

Tan, Y. K. 2003. Inclusion of International Real Estate in Real Estate Portfolio. American Real Estate Society (19th Annual Meeting) Conference Paper.

Webb, J. and Rubens, J. 1988. The Effect of Alternative Return Measures on Restricted Mixed-Asset Portfolios. *AREUEA Journal*, Vol. 16, No. 2, 123-137.

Webb, J., Curcio, R., and Rubens, J. 1988. Diversification Gains From Including Real Estate In Mixed-Asset Portfolios. *Decision Sciences*. Vol. 19, 434-452.

Wilson, P. and Okunev, J. 1996. Evidence of Segmentation in Domestic and International Property Market. *Journal of Property Finance*. Vol. 7, No. 4, 78-97.

Wilson, P. and Okunev, J. 1999. Long-Term Dependencies and Long Run Non-Periodic Co-Cycles: Real Estate and Stock Markets. *Journal of Real Estate Research*. Vol. 18, No. 2, 257-278.

Worzala, E. and Newell, G. 1997. International Real Estate: A Review of Strategic Investment Issues. *Journal of Real Estate Portfolio Management*. Vol. 3, No. 2, 87-96.

UBS Warburg. 2003. UBS Warburg Indices: September 2003 (miscellaneous copies and data in spreadsheet). UBS Warburg: Sydney.

Ziobrowski, A. J., Cheng, P. and Ziobrowski, B. J. 1997. Using a Bootstrap to Measure Optimum Mixed-Asset Portfolio Composition: A Comment. *Real Estate Economics*. Vol. 25, No. 4, 695-705.

Figure 1: Asset Indices: June 1997- March 2003

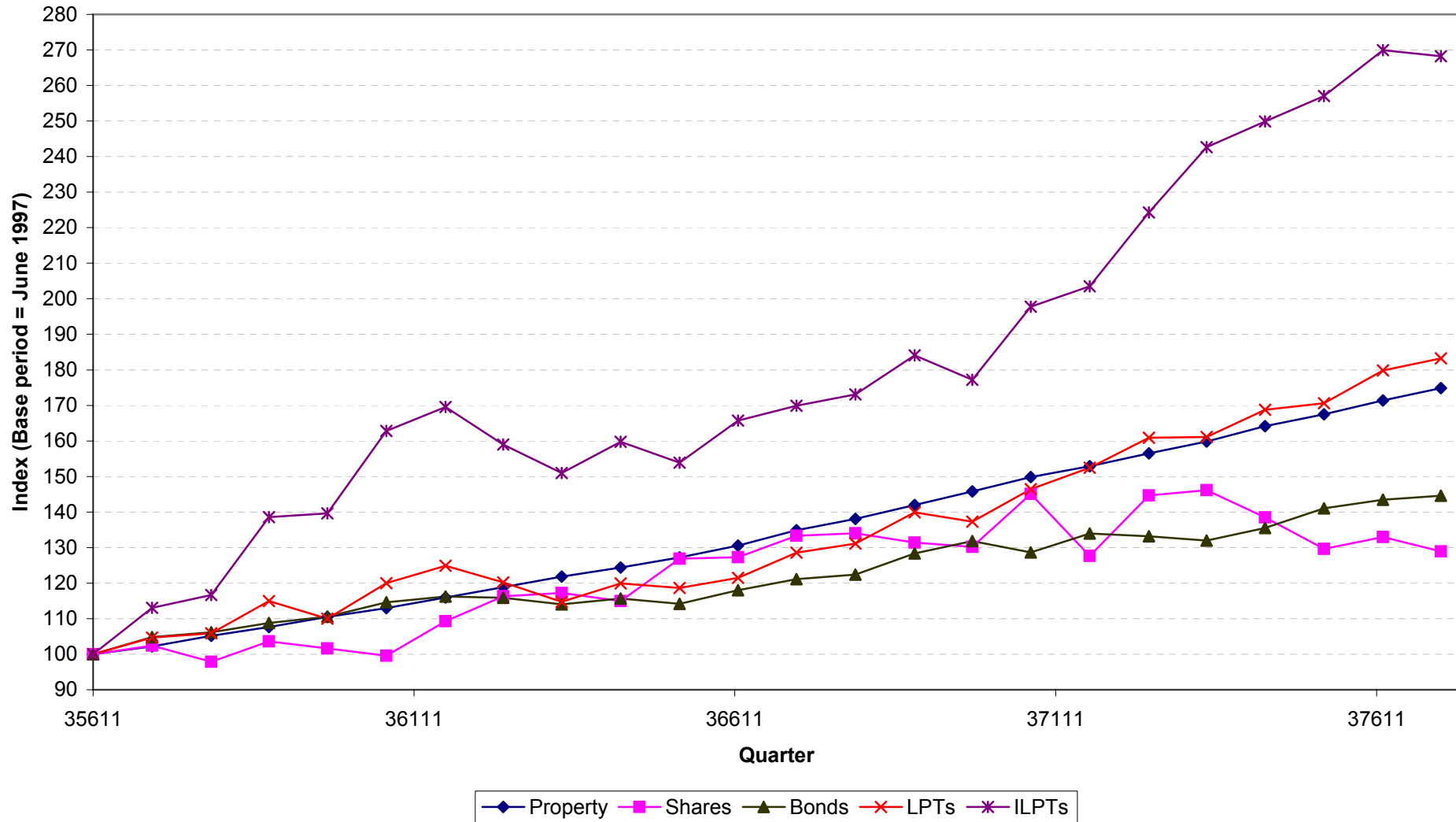


Figure 2: Efficient Frontiers of Various Mixed Asset Portfolios

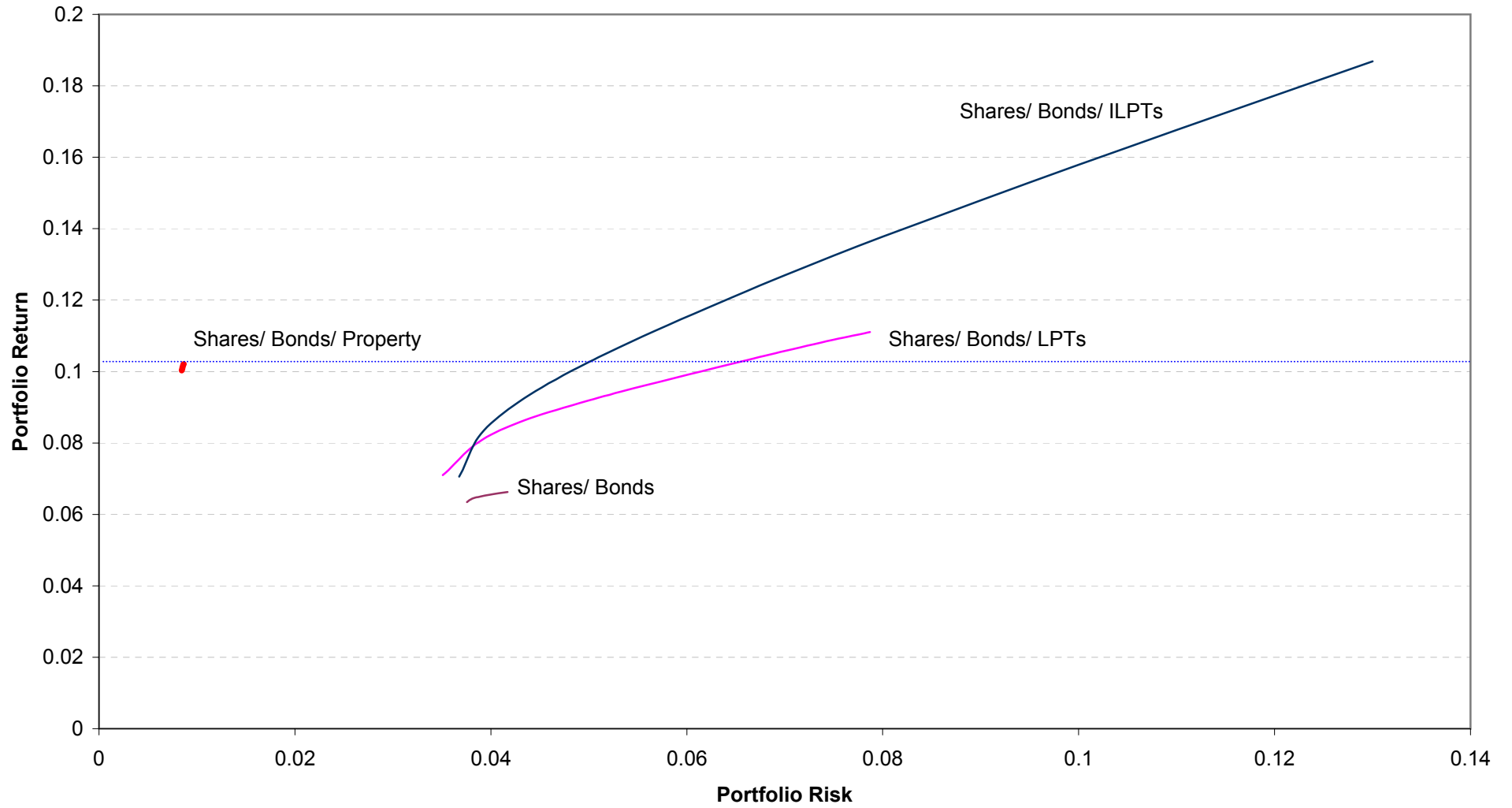


Figure 3: Efficient Frontiers of Various Mixed-Asset Portfolios

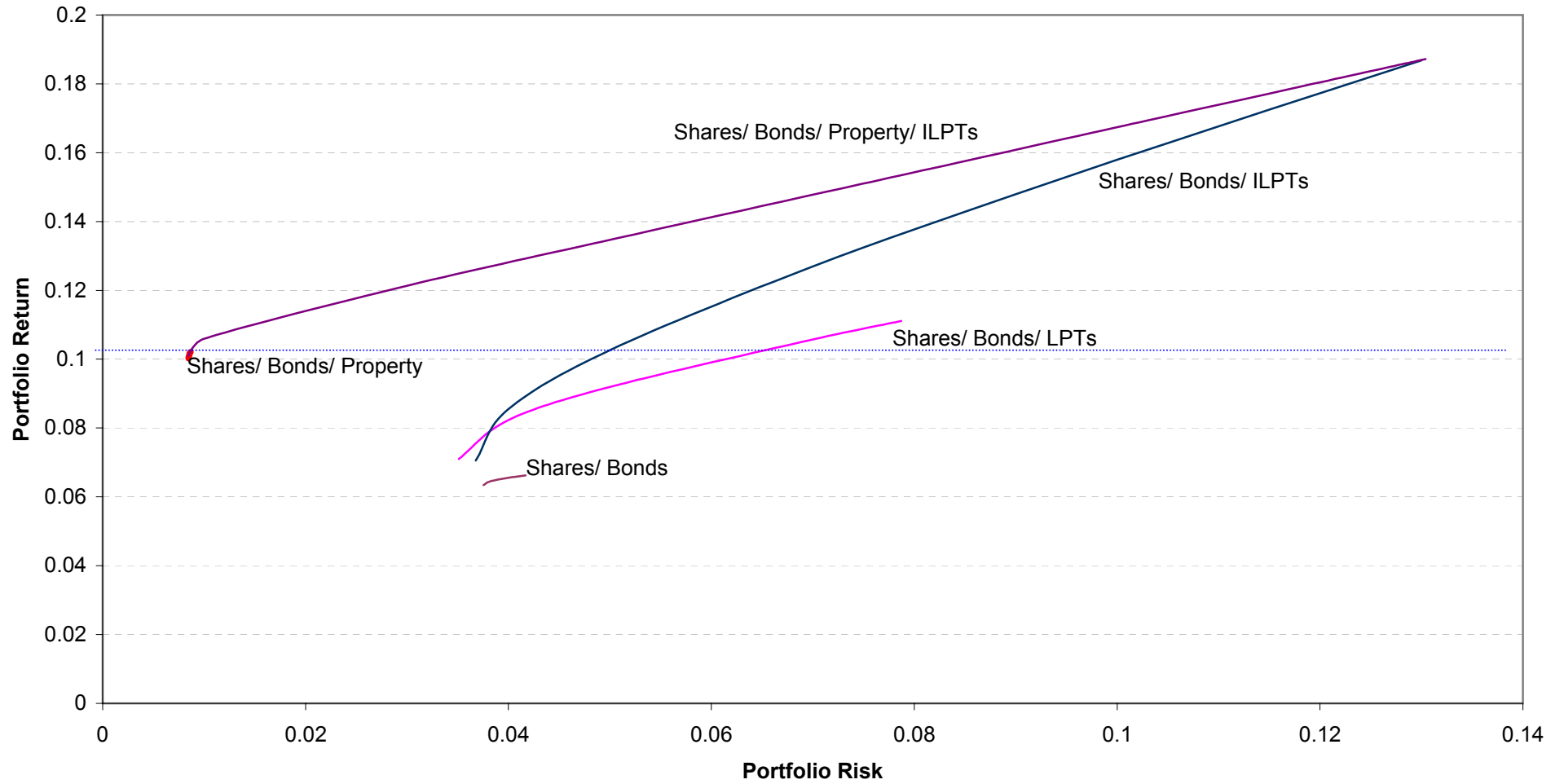


Figure 4: Mixed-Asset Portfolio Allocations: Shares/ Bonds/ Property/ International LPTs

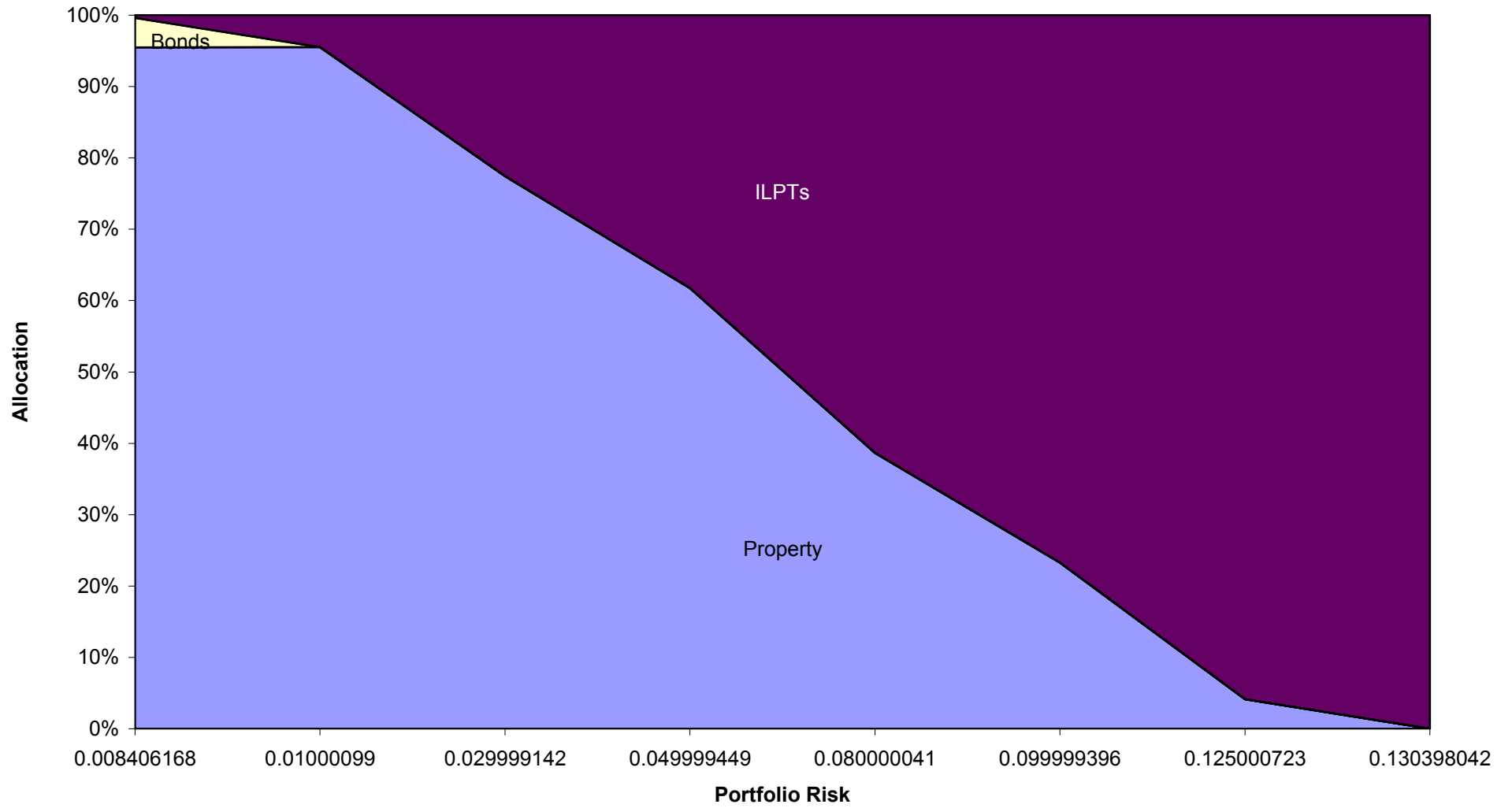


Figure 5: Efficient Frontiers of Various Mixed-Asset Portfolios

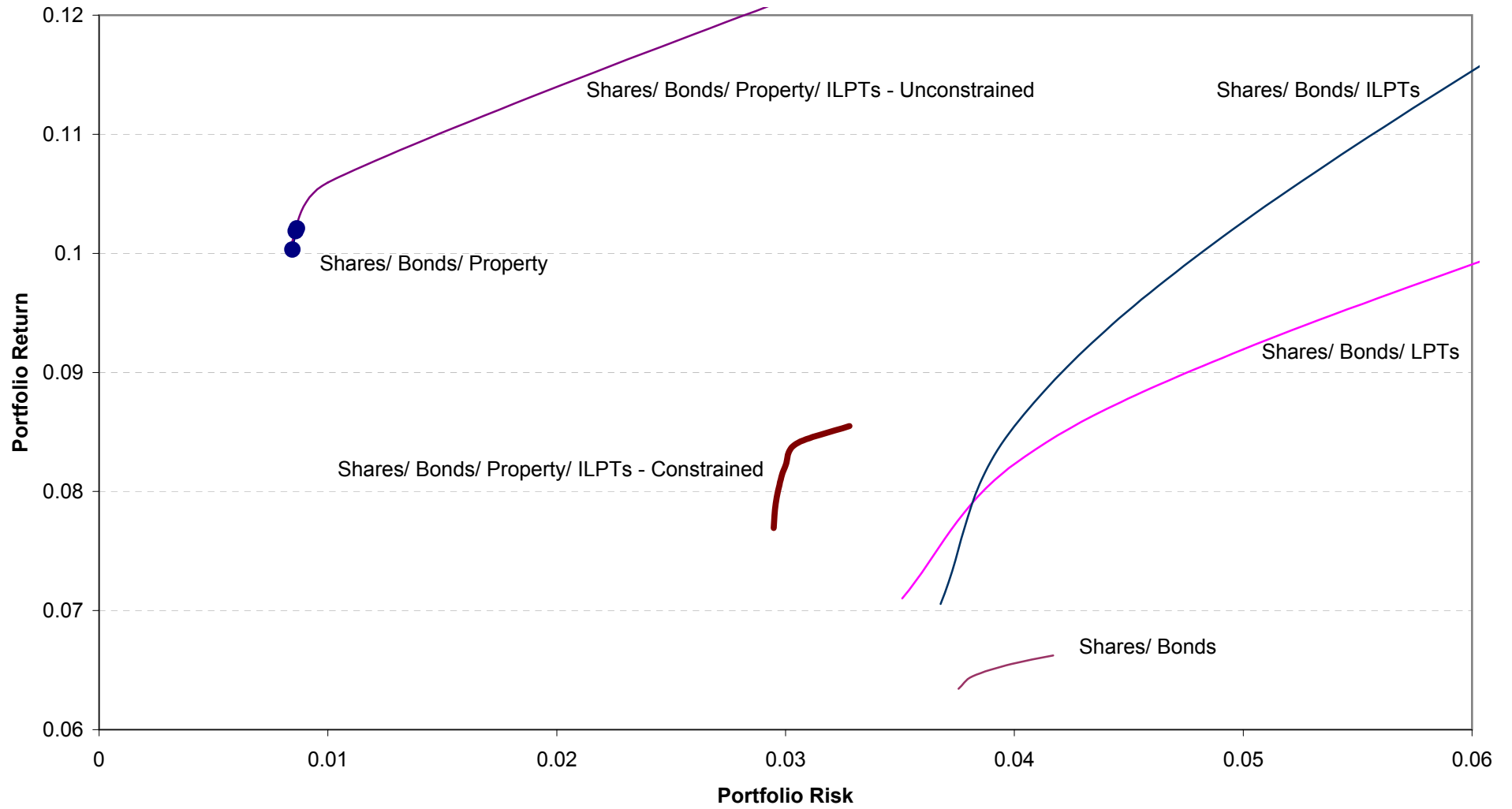


Figure 1: Efficient Frontiers of Various Mixed-asset Portfolios (by Property Type)

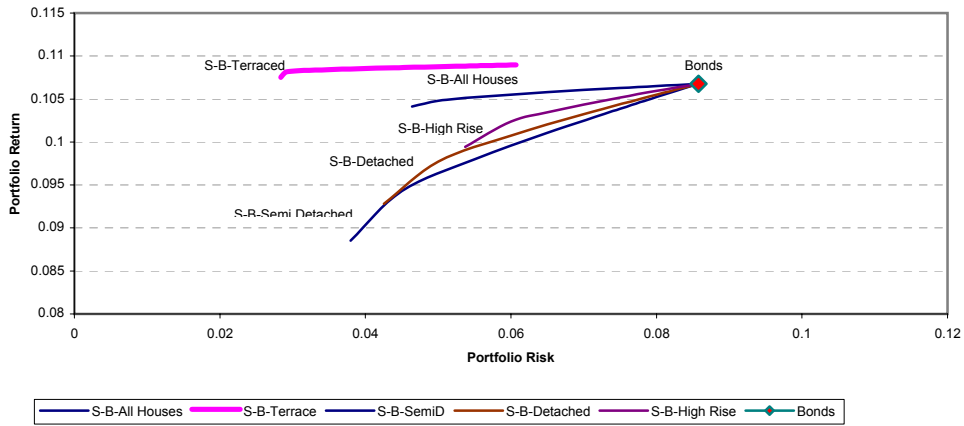


Figure 2: Optimal Mixed-asset Allocations (All Houses)

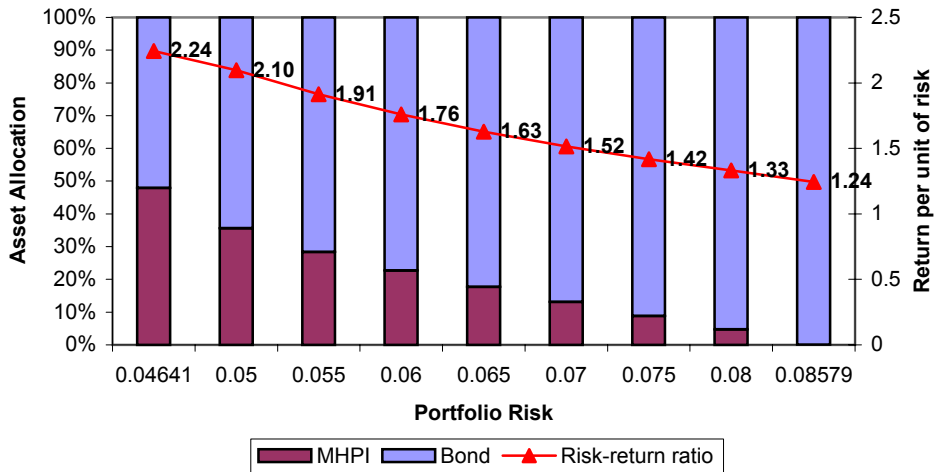


Figure 3: Optimal Mixed-asset Allocations (Terrace)

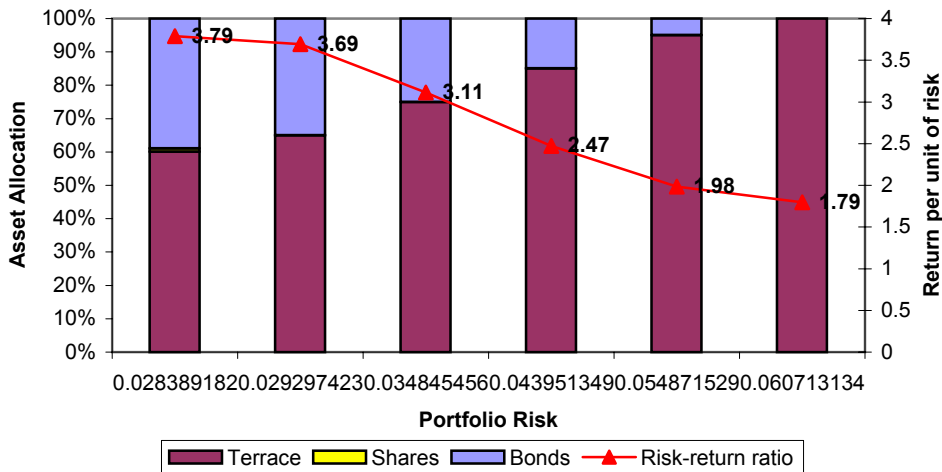


Figure 4: Optimal Mixed-asset Allocations (Semi-Detached)

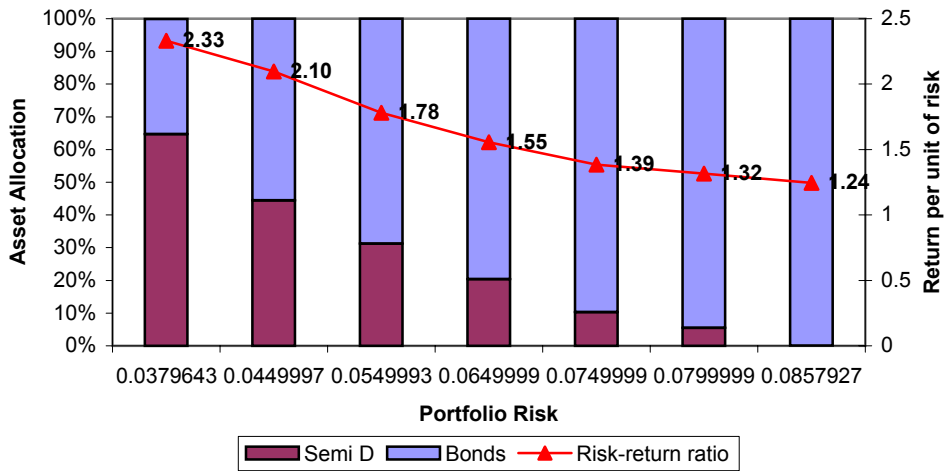


Figure 5: Optimal Mixed-asset Allocations (Detached)

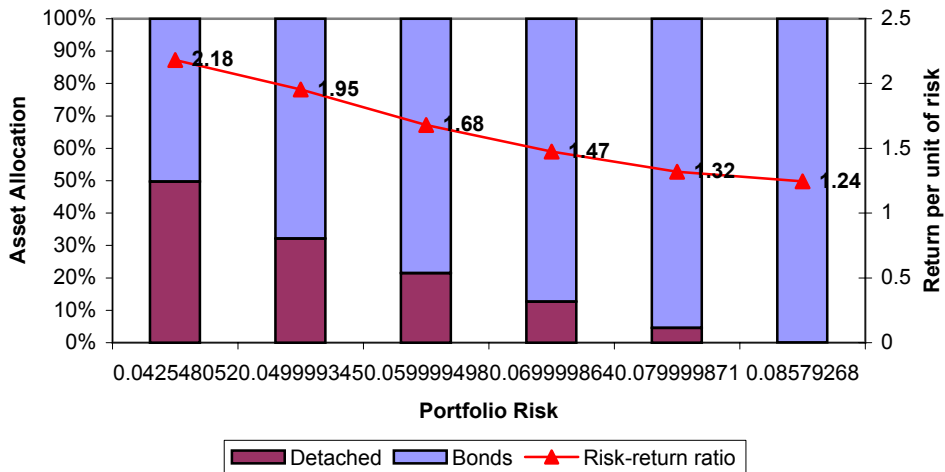


Figure 6: Optimal Mixed-asset Allocations (High Rise)

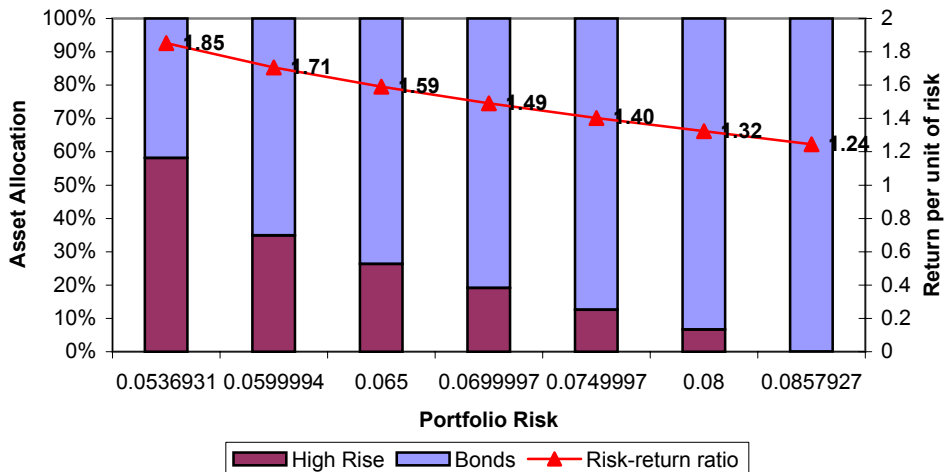


Figure 7: Efficient Frontiers of Various Mixed-asset Portfolios (by Property Region)

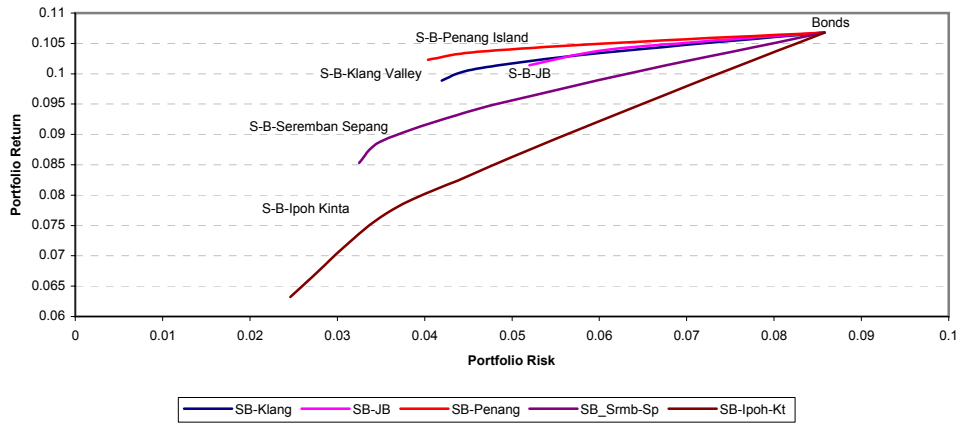


Figure 8: Optimal Mixed-asset Allocations (Klang Valley)

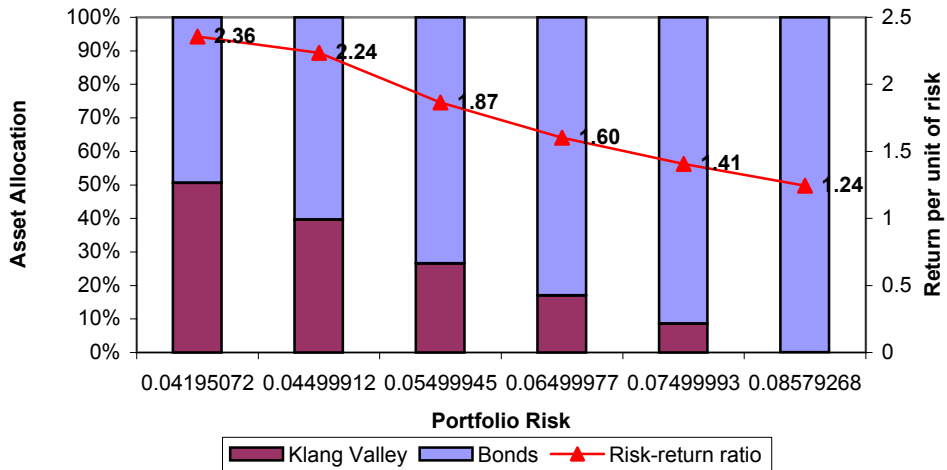


Figure 9: Optimal Mixed-asset Allocations (Johor Baru)

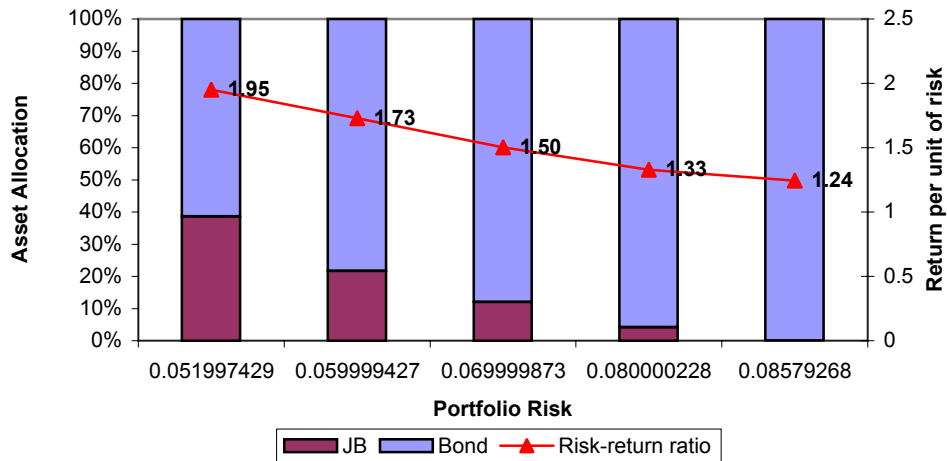


Figure 10: Optimal Mixed-asset Allocations (Penang Island)

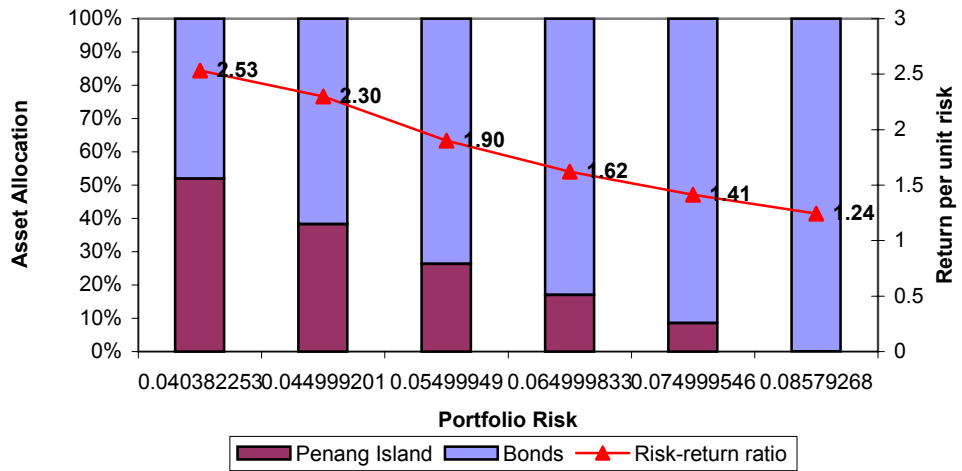


Figure 11: Optimal Mixes-asset Allocations (Seremban-Sepang)

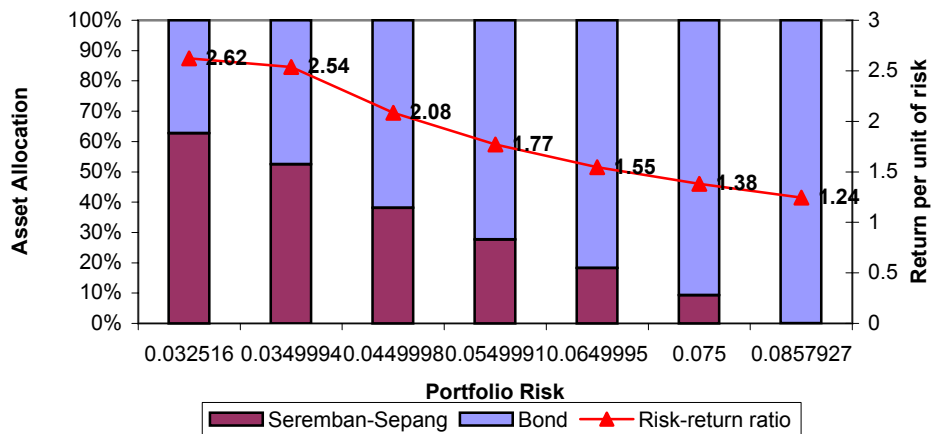


Figure 12: Optimal Mixed-asset Allocations (Ipoh-Kinta)

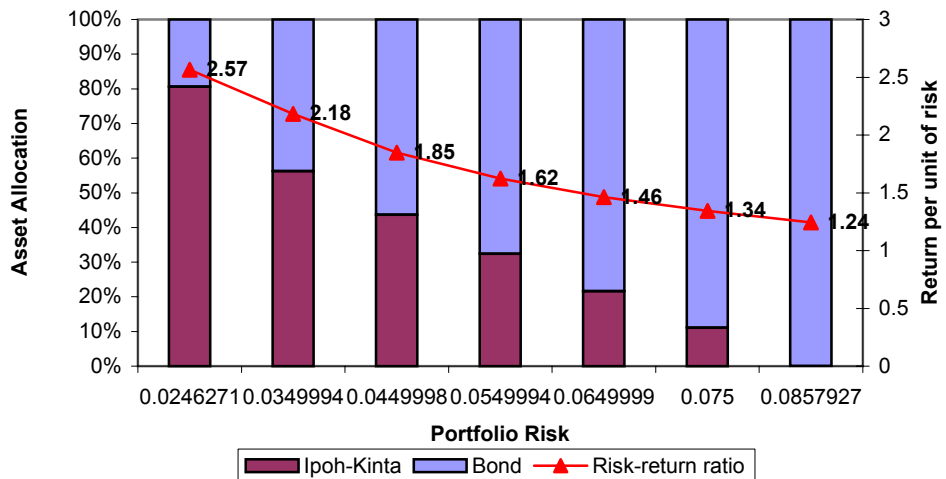


Figure 13: Constrained Optimal Mixed-asset Allocations (All Houses)

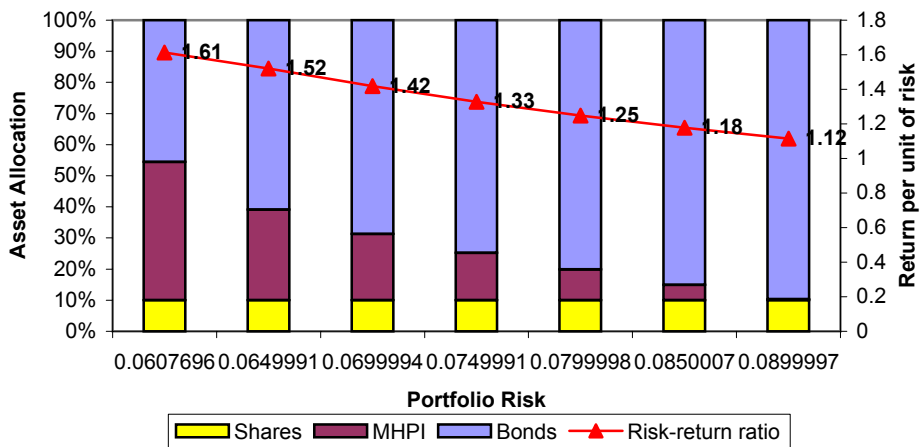


Figure 14: Constrained Optimal Mixed-asset Allocations (Terraced)

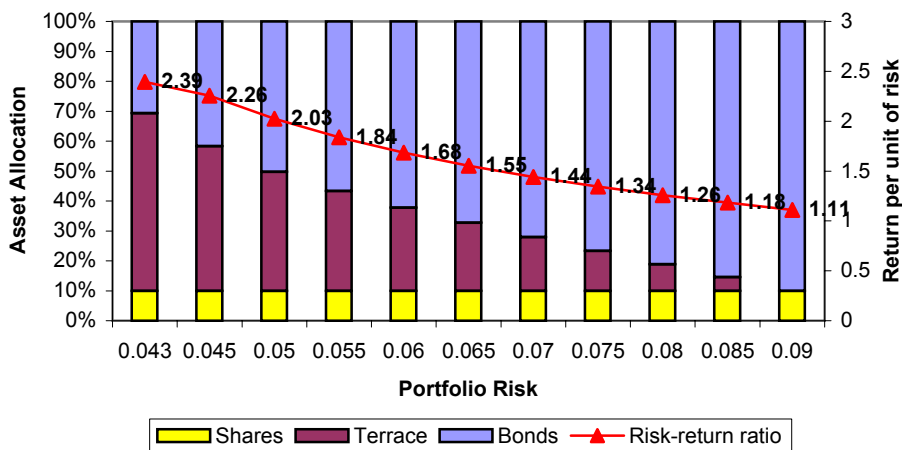


Figure 1: Efficient Frontiers of Various Mixed-asset Portfolios (by Property Type)

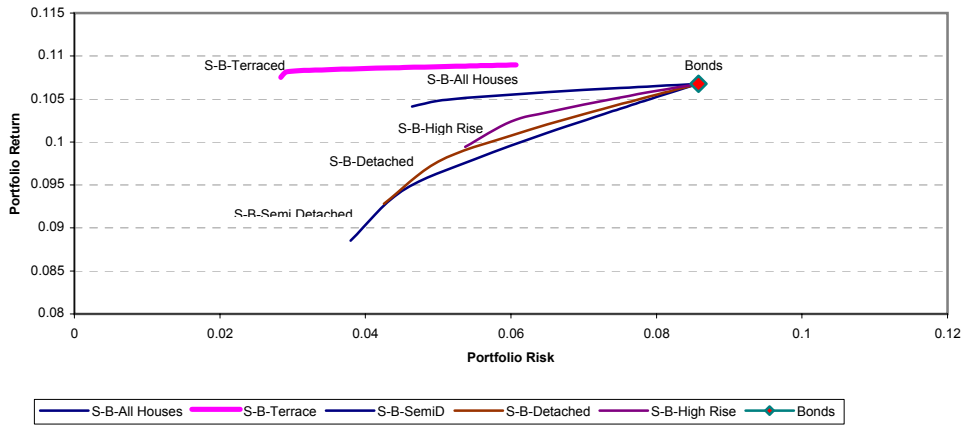


Figure 2: Optimal Mixed-asset Allocations (All Houses)

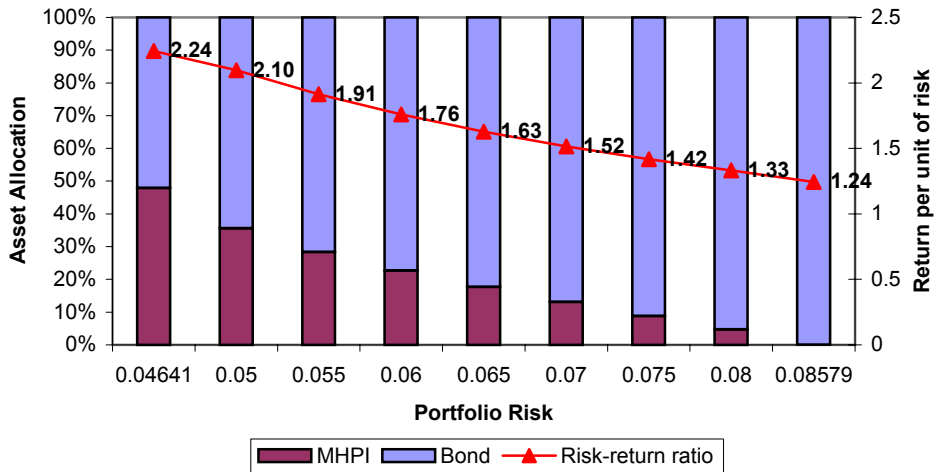


Figure 3: Optimal Mixed-asset Allocations (Terrace)

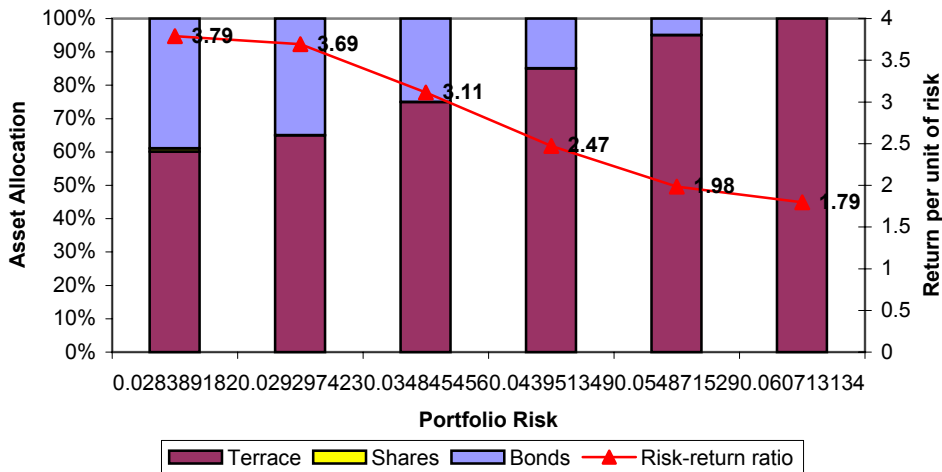


Figure 4: Optimal Mixed-asset Allocations (Semi-Detached)

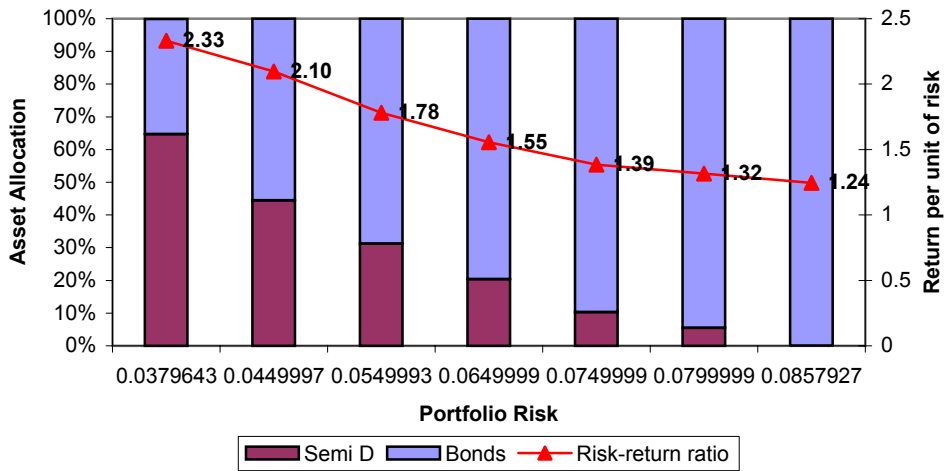


Figure 5: Optimal Mixed-asset Allocations (Detached)

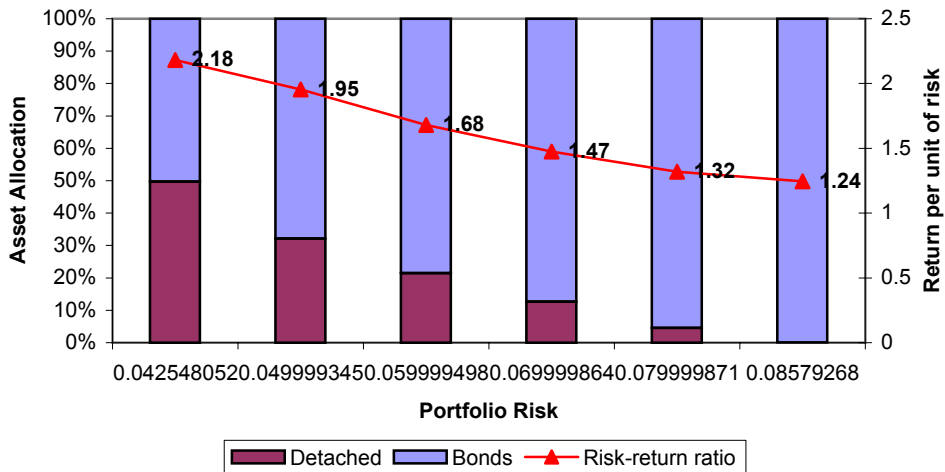


Figure 6: Optimal Mixed-asset Allocations (High Rise)

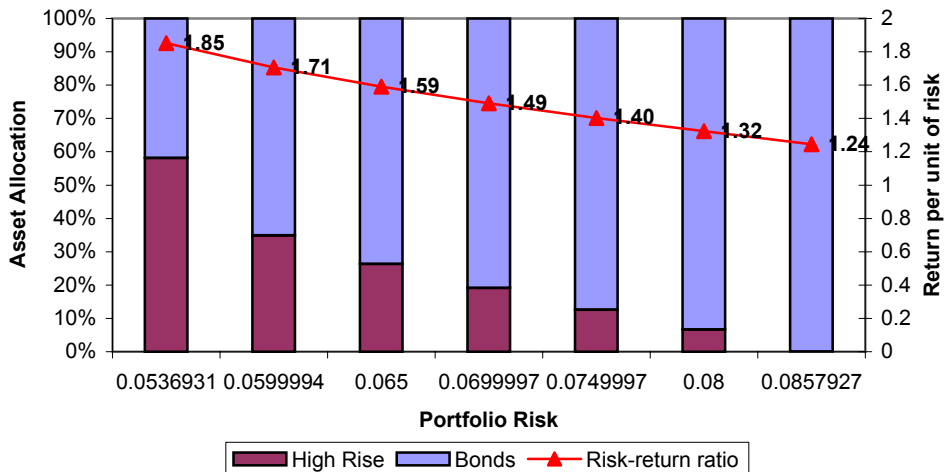


Figure 7: Efficient Frontiers of Various Mixed-asset Portfolios (by Property Region)

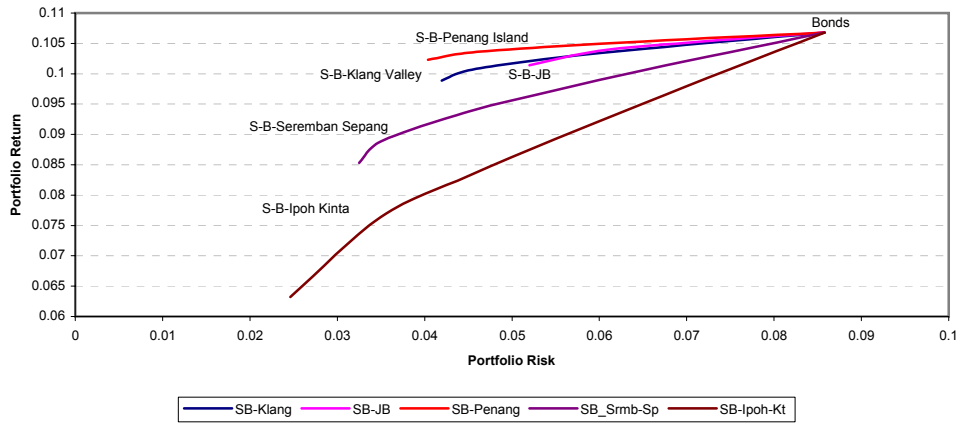


Figure 8: Optimal Mixed-asset Allocations (Klang Valley)

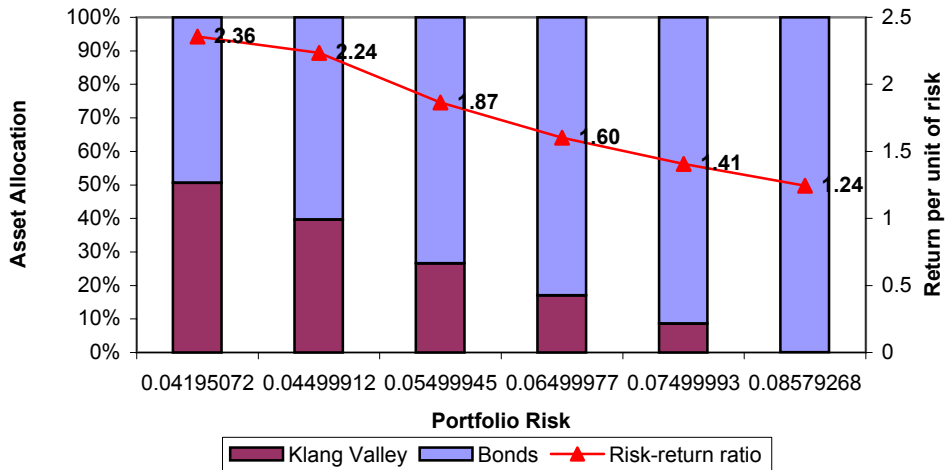


Figure 9: Optimal Mixed-asset Allocations (Johor Baru)

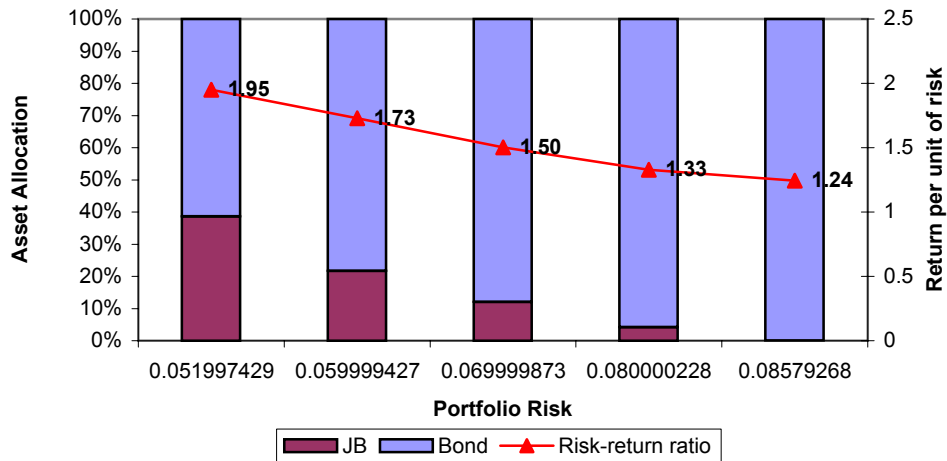


Figure 10: Optimal Mixed-asset Allocations (Penang Island)

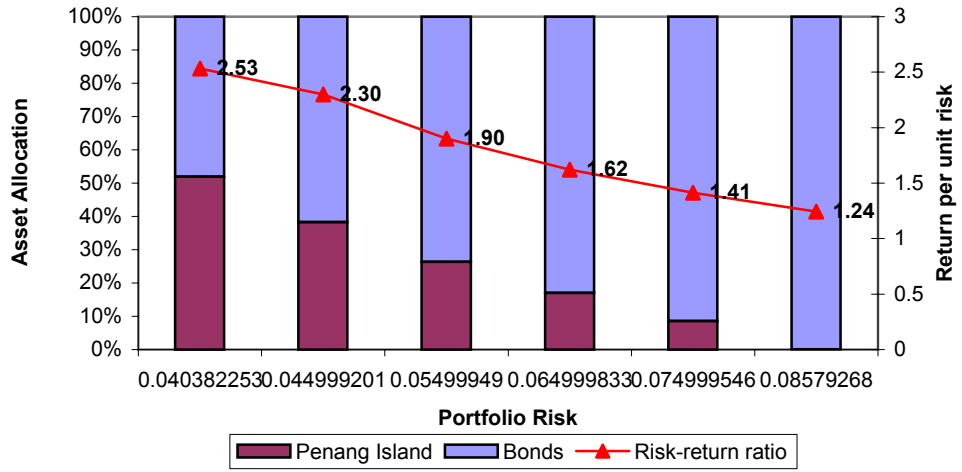


Figure 11: Optimal Mixes-asset Allocations (Seremban-Sepang)

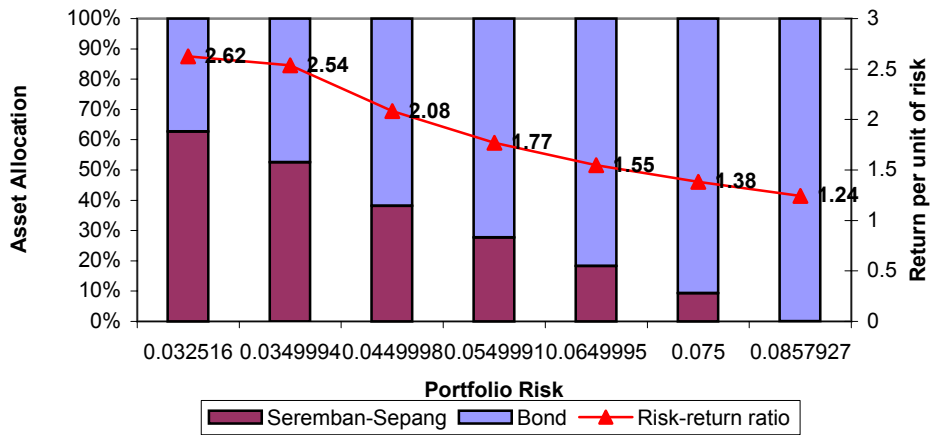


Figure 12: Optimal Mixed-asset Allocations (Ipoh-Kinta)

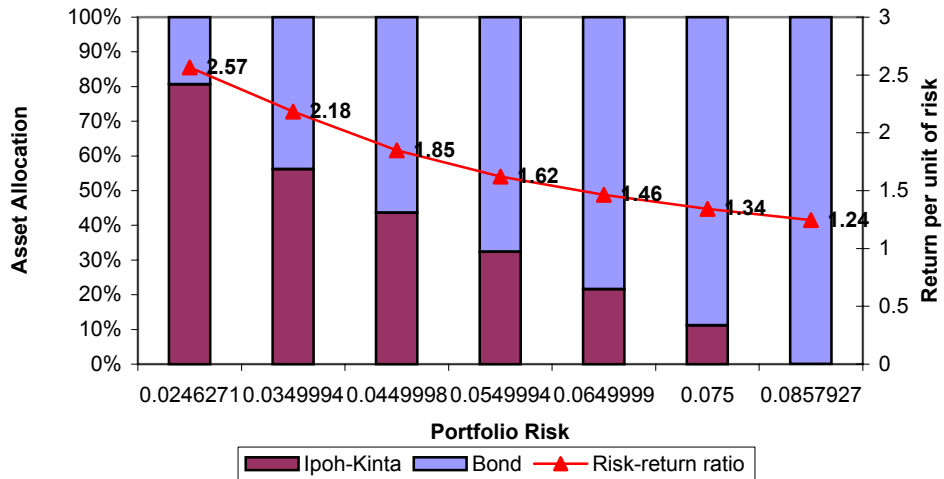


Figure 13: Constrained Optimal Mixed-asset Allocations (All Houses)

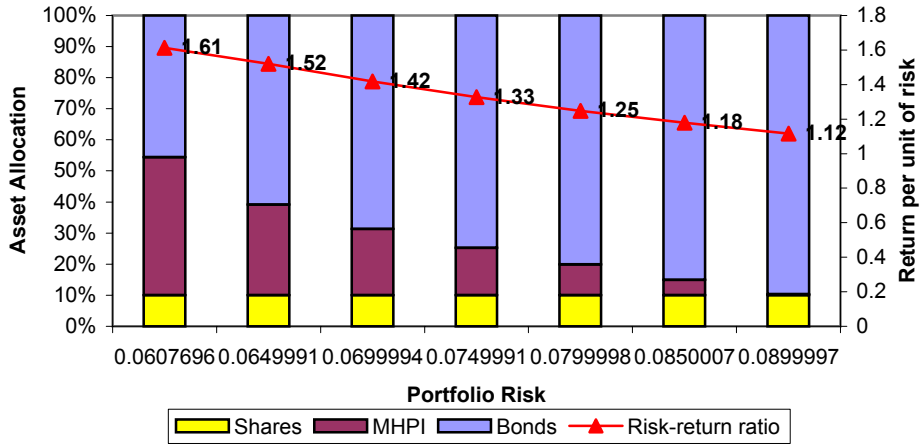


Figure 14: Constrained Optimal Mixed-asset Allocations (Terraced)

