Behaviours of Property Investors: An Investigation on the Risk Perceptions of Australian Property Fund Managers

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Abstract

Recent finance and real estate empirical and analytical studies have demonstrated that downside risk appears as an intuitively appealing risk measure in which it is more consistent with investors' behaviours. Conversely, qualitative studies into the behaviours of investors, particularly real estate investors, have been relatively limited. This study seeks to address this shortfall and aims to examine the behaviours of property fund managers towards downside risk. A survey was conducted in order to investigate the risk perceptions of property fund managers and determine whether they only require compensation for bearing with higher downside risk. The acceptance level of downside risk in the property funds industry in Australia is also examined. The findings reveal that downside risk is more consistent with how investors individually perceive risk. However, there is also a gap between theoretical assertions and practice in which downside risk is not commonly used in the practice. The results give an insight into the knowledge base of property investors towards downside risk.

Keywords: Australian property funds, downside risk, investors' behaviours, property investors and risk perceptions.

1.0 INTRODUCTION

A number of recent studies have offered some analytical and empirical evidence to support the use of downside risk. In this context, downside risk is a risk measure that decomposes the variability of return into the upside and downside parts. Importantly, it is a risk measure that only focuses on downside part. The concept of 'downside risk' was first discussed in the early 1950s with the introduction of the concept of the safety first rule by Roy (1952). The safety first rule argues that investors would prefer an investment with the smallest probability of falling below a disaster level. Harlow (1991) also highlighted that downside risk is an appropriate description of investment risk because investors are usually more concerned about losses relative to a threshold return level. Markowitz (1959), commonly referred to as the 'father of Modern Portfolio Theory', also recognised the importance of this argument. As a result he suggested the use of semi-variance for measuring the downside risk of an investment.

However, the concept of downside risk was only introduced into the real estate context by Sing and Ong (2000) and Sivitanides (1998) in the late 1990s. Sivitanides (1998) has examined the implications of downside risk to real estate portfolio construction where the results showed that the standard deviation overstated the risk for investors. Sing and Ong (2000) found similar results in which the downside risks (CLPM and SLPM) have lower deviations than variances. Importantly, Cheng (2001) and Coleman and Mansour (2005) have offered evidence of the downside allocation model appears to be a more rational model for real estate allocation. The rationales of using downside risk are that neither normal return distribution assumption nor a quadratic utility function assumption is required (Estrada, 2002, Nawrocki, 1999, Sing and Ong, 2000). The normal distribution assumption has been rejected by extensive studies such as Myer and Webb (1993, 1994). Bond and Patel (2003) also suggested using downside risk (semi-standard deviation) as the risk measure if the returns are found to be skewed.

Extensive utility studies have also shown that the quadratic utility function assumption for traditional variance risk measure undermines the utility function's ability to describe the actual behaviour of investors (Arrow, 1971, Pratt, 1964, Wippern, 1971). The introduction of prospect theory and disappointment aversion (DA) theory in utility literature by Gul (1991) and Kahneman and Tversky (1979) further improved the utility theories in describing investor's behavioural. The theories posit that the impacts of losses are greater for investors or agents in comparison to gains. Importantly, these theories imply that downside risk is more consistent with investors' behaviour particularly for investors who are averse to downside losses. More specifically, downside risk measure clearly indicates that investors view upside gains and downside losses in a different manner, however, investors generally are more concerned about the downside variability of their investments than the upside gains; upside variability is also argued as upside potential and not the risk for investors. These features have made downside risk appears to be a more efficient risk measure as it is consistent with investor behaviour.

Several researchers have also extended the downside risk measure into an asset pricing model and proposed the Lower Partial Moment-CAPM (LPM-CAPM) (Bawa and Linderberg, 1977, Harlow and Rao, 1989, Hogan and Warren, 1974). They argued that downside beta is a preferred market-related risk measure in comparison to traditional beta. Galagedera (2007), Nantell et al. (1982) and Price et al. (1982) have also provided further evidence for the importance of examining downside beta. They confirmed that downside beta is empirically different from traditional beta if the return distributions are asymmetrically distributed. Moreover, in the real estate context, Lee et al. (2007b) demonstrated that the determinants for beta and downside beta in Australian LPTs are dissimilar.

More recently, Ang et al. (2006) and Post and Vilet (2004) in finance literature and Cheng (2005) and Lee et al. (2007a) in real estate literature have confirmed that downside beta is a more favourable risk measure than traditional beta in asset pricing. Indeed the results exhibited that downside beta has strong exploratory power in explaining return variations; however there is no similar evidence for upside beta and beta. This indicates that downside beta is the only risk that is priced by investors. Nevertheless, this has also raised the issue of "why is only downside beta priced?" A possible explanation is that investors only require compensation for downside risk, whilst they do not necessarily require a risk premium for upside potential. This statement is consistent with the findings from the survey of US business executives (Mao, 1970) and confirms that downside risk is an efficient risk measure. The reason of its recognition is that it is consistent with how investors individually perceive risk. Nevertheless, relatively few surveys or qualitative studies has been involved with property investors.

More importantly, the acceptance of the theoretical assertions in industry is questionable. A survey of Australian property securities fund managers revealed that most of the fund managers rated that downside risk is a less important risk measure (Tan, 2004). This finding is consistent with the argument of Brown and Matysiak (2000), where the main disadvantage for using downside risk at present is that the analysis is not well understood. Sing and Ong (2000) have also argued that the unfamiliarity and complexity of downside risk computation could be the factors that hampering practitioners' acceptance towards downside risk. Evans (2004) has also revealed that the standard deviation is the most popular risk measure for investors which is consistent with the findings from Mao (1970). The study depicted that variance is generally accepted and used as risk measure in capital budgeting theory, even though the respondents only concerned with downside losses. In portfolio management, Louargand (1992) and Worzala et al. (2000) also provided evidence that theoretical assertions from portfolio analysis are not necessarily followed by practitioners. Clearly, there is a conflict between theory and practice.

Moreover, Evans (2004) exhibited that there is no relationship between risk tolerance level and expected returns from a survey, although this contradicts with the fundamental investment rule that 'higher risk equates to higher return'. Similarly, the findings of Worzala et al. (2000) also indicated that property investors do not believe

that higher inherent risk for a particular asset can be justified by the higher return. French (2001) also argued that the assertions from normative models are rarely employed in the practice.

It should be noted that not all of the theoretical assertions will be rejected by practitioners. Worzala and Newell (1997) compared the results from two surveys with European investors (Worzala, 1994) and Asian investors (Newell and Worzala, 1995) and found that European and Asian investors recognised the importance of international real estate investment in enhancing portfolio diversification. This is consistent with the assertions from previous empirical studies, which the diversification benefits for international real estate have been highlighted in real estate literature (Worzala and Sirmans, 2003, a review).

Overall, extensive theoretical evidence has revealed that downside risk is more consistent with investor behaviour. Conversely, there is a gap between theoretical assertions and practice. In other words, the theoretical assertions from empirical and analytical studies for downside risk might not necessarily be accepted by practitioners. However, no study has been undertaken on the risk perceptions of property investors and their support of downside risk. Consequently, this study seeks to address this gap by examining the perceptions of property fund managers in Australia towards risk and their perception of downside risk.

The contributions of this study are twofold. Firstly, this study attempts to contribute a greater understanding of the investors' behaviours by conducting a survey about how individual investors actually perceive risks. This attempt is unique as many previous real estate studies have focused specifically on empirical approaches, while little has been placed on qualitative analysis. More importantly, previous studies have confirmed that the empirical and analytical assertions are not necessarily automatically be accepted by practitioners. Secondly, the survey is also one of the first attempts to comprehensively examine the acceptance level of practitioners for the concept of downside risk, as well as to identify the factors that hinder their acceptance of downside risk.

The balance of this paper is organised as follows. Next is a review of the significance of Australian property funds industry, followed by a discussion on data collection and analysis. Thereafter, results and discussion are presented and discussed with the conclusion following.

2.0 SIGNIFICANCE OF AUSTRALIAN PROPERTY FUNDS INDUSTRY

Australia is one of the most securitised real estate markets in the world where Australian property funds industry plays a significant role in the Australian property market. As at 3 January 2005, Australian listed property market was the second largest securities market in the world with total market capitalisation of US$63.3 billion (PREI, 2005). In December 2006, more than 60% of the commercial invested

real estate in Australia and New Zealand are in a securitised form. On the other hand, the importance securitised real estate market in US and European countries were substantial lower than in Australia, where in comparison there was a contribution of less than 10% of their total commercial invested real estate market (RREEF, 2007).

Listed Property Trust (LPT) is the most popular structure among Australian investors to involve in property fund investments. In 2006, approximately AUD$143 billion total assets were managed by LPTs (PIR, 2006). As at 31 March 2007, the total market capitalisation of LPTs was approximately AUD$137 billion, representing around 10% of the total Australian share market. In addition, LPTs appeared as one of the largest sub-sectors on ASX (ASX, 2007a, 2007b). Most importantly, table 1 reveals that LPTs had been one the strongest performing sectors over the past 10 years with the highest average return in comparison with other assets (e.g. share, direct property and bonds).

(Insert Table 1)

In fact, LPTs are the only one type of indirect property vehicles in Australian property funds industry. Almost half of the property funds (49%) consist of unlisted property trusts, wholesale funds, property syndicates and property securities funds. It should be noted that in 2006, all of these property funds owned over 5,600 institutional-graded commercial properties in Australia and overseas with total assets of approximately AUD$275 billion with over 1.2 million investors (PIR, 2006). More importantly, in March 2007 almost 60% of the total assets of Australian institutional-graded commercial property assets were owned by Australian property funds (ABS, 2007). In respect to the importance of Australian property funds industry in the Australian commercial property market, it is essential to understand the risk perceptions of Australian property fund managers and importantly how they perceive risk.

3.0 DATA AND METHODOLOGY

The aim of this study is to examine the risk perceptions of property fund managers towards downside risk, and to achieve this, a questionnaire was designed in order to obtain the property fund managers views and opinions about risk. A closed question style was designed and most questions were structured using the likert scaling technique.

The information for each property fund was mainly identified via Australian Property Funds Industry Survey 2006 report, which was published by *Property Investment Research (PIR).* A total 233 property funds were identified from both the report and the ASX website (www.asx.com.au). Note that the mortgages property funds (60 funds) were excluded from this survey in line with the difference investment

characteristics and nature of this type of business.[1] Moreover, there were 35 property funds without complete information due to several difficulties such as the funds were recently privatised, incomplete corresponding mailing and/or email addresses for the funds, no information on the contact person who should be contacted and so on. In turn this resulted in a total of 138 samples with complete corresponding information being used in this analysis. In order to verify the reliability of the questionnaire, a pilot test with small number of funds was conducted. This was followed by minor changes before the full questionnaire was distributed.

The questionnaire is categorised into three parts. The first part of the questionnaire focuses on both the profile of the respondents as well as the respondents' organisations, where the organisation's background and risk management practice are identified. The second part of the questionnaire emphasises the respondents' risk perceptions as well as their understanding on the concept of downside risk. The final part of the questionnaire focuses on employing downside risk in their organisations. The key motivations of employing downside risk, as well as the hurdles that hinder the use of downside risk among property fund managers, are also investigated. The survey was conducted during May-June 2007 and the questionnaires were distributed to the property fund managers that based throughout Australia via mail or email. To enrich the insights of this study, 6 respondents were also invited to participate with the personal interviews[2]. The interviews were face-to-face structured interviews and each interview lasted approximately one hour.

Most questionnaires were sent to the respondents who are at the level of "Managing Director" or "General Manager" or "Fund Manager". This approach was designed to benefit the study by ensuring a high level of reliability. In addition, the respondents have daily exposure to the fund's management, decision-making process, portfolio management, performance measurement as well as risk management. Accordingly they were the most suitable person for responding the questionnaires. Their responses were then sorted and analysed using frequency analysis and cross-tabulation analysis. As required by University of Melbourne Human Ethics Office, the identity of the respondents will not be disclosed in this study.

4.0 RESULTS AND DISCUSSIONS

4.1 Profile of Australian Property Funds

This section provides an overview of the profile of respondents and their organisation. An invitation letter and questionnaire were sent simultaneously to the

[1] A pilot study with the mortgages property funds indicated that most of the mortgages property fund managers did not view their funds as property funds. Also they did not think most of the issues/questions are applicable for their funds. Additionally, the response rate was substantially low. Therefore, these funds were excluded from this survey.

[2] The interviews were only conducted in Melbourne due to the resources limitations.

138 respondents. 6 respondents formally returned the questionnaire and declined to participate in this survey, resulting in an effective sample of 132. It must also be noted that no evidence is available to show that these 132 fund managers had agreed to participate in this survey. While, only 30 fund managers responded to the survey, equating to an overall response rate of approximately 23%.

A non-response analyse was conducted in order to examine the presence of non-response bias in this study and determine whether the findings based on the responses of these 30 respondents can be generalised to the population[3]. A followed-up approach of non-response analysis was employed in this study in which a reminder was sent to the non-respondents. As highlighted by Rogelberg and Stanton (2007), the collected information and data from followed-up respondents can be used to compare with the responses from early respondents on actual survey topic variables. This is a meaningful procedure in order to deal with the non-response bias.

The test was conducted and no considerable difference was found by comparing the responses from early respondents and follow up-respondents samples. Indeed, the results exhibit that only one survey topic variable/question (heard about downside risk before this survey) from both samples is statistically significant at the 5% level. No similar result is evident for other variables, suggesting that the absence of non-response bias in this survey is demonstrated and this 23% response rate can be used to generalise to the population.[4] Thereafter, the analyses are conducted based on the responses from the 30 respondents. Firstly, the profile of 30 respondents is exhibited in figure 1.

(Insert Figure 1)

In general, most of the respondents were attached to an LPT. It is followed by Unlisted Property Trusts, Wholesale Property Funds, Property Securities Funds and Property Syndicates. This is quite consistent with the organisational breakdown of the Australian property funds industry, which is largely dominated by LPTs.

(Insert Figure 2)

Almost 83% of respondents have a benchmark for their funds where a range of benchmarks were employed by respondents. Figure 2 compares the benchmarks that are employed by Australian property funds. The S&P/ASX 200 Property Trust Index appears as the most often used benchmark for Australian property funds. In addition, the S&P/ASX 300 Property Index, S&P/ASX 200 Property Accumulation Index,

[3] Werner et al. (2007) show that the non-response analyses are reported in almost 1/3 of the survey studies that are published in nine management journals (Tiers 1, 2 and 3).
[4] The results are shown in the appendix I

MERCER property fund index and Consumer Price Index (CPI) plus a specific target rate are also commonly used indices. Finally, the S&P/ASX 200 and S&P/ASX 300 Property Accumulation Index are the least common indices, although not all of these funds are required to outperform the benchmark with only 63% of them are required to outperform the benchmark. On the other hand, 37% of the respondents do not have any obligation to outperform the benchmark. In other words, only about 60% of property fund managers could be remunerated with a performance fee.

Surprisingly, almost half of the respondents do not have any specific risk measure. Nevertheless, this does not indicate that risk management is irrelevant for these funds. Many respondents pointed out that although no explicit risk measure is employed, the funds have also attempted to minimise their investment risk via some property/ project specific measures such as monte carlo simulation, scenario analysis and stress analysis. It is also believed that these measures could provide more reliable risk measurement. The specific risk measures that are employed by the property funds are presented in figure 3.

(Insert Figure 3)

Figure 3 presents the risk measures that are employed by most property funds. It is clear that the standard deviation (SD) appears as the most common risk measure; it is followed by beta, tracking error and risk-adjusted ratio. These results are consistent with the results from previous survey of US private investors and US business executives (Evans, 2004, Mao, 1970). This confirms that SD and variance framework risk measures are widely used risk measure among practitioners. Alternative risk measures such as downside risk and value at risk (VaR) are relatively seldom used risk measures among property investors.

4.2 Risk Perceptions

The previous section confirmed that variance and variance-related risk measures are the commonly used risk measures while downside risk usage is relatively uncommon. Does this indicate that variance and variance-related risk measures are more consistent with property investors' risk perceptions? In this section, the perceptions of Australian property fund managers towards risk are surveyed and investigated.

Property fund managers were asked a series of questions in order to examine their perceptions towards risk. Firstly, the property fund managers were given a hypothetical situation in which they were asked to assume that the benchmark return for their funds is 8%. Then, they were asked to respond whether they would concern if the performance of their fund fell below the target rate. Finally, they were asked whether they would worry if the performance of their funds rose above the target rate. Tables 2 and 3 present the results.

(Insert Table 2)

In table 2, it can be observed that property fund managers tend to agree that downside losses are risks for their investments. The majority (80%) of the respondents agreed that they would be concerned if their funds failed to achieve the target rate. This indicates that most of the fund managers agree that the downside part is risky. This result also confirms the previous empirical findings by Ang et al. (2006), Cheng (2005) and Lee et al. (2007a) in which downside beta is priced by investors. The results also provide a possible explanation to why downside beta is priced, which is documented by extensive empirical studies. However, almost 17% of respondents would not worry if their fund performance fell below the target rate.

(Insert Table 3)

Table 3 exhibits the results of fund managers' perceptions towards upside potential. Overall almost 63% of respondents would not worry if their funds outperform the target rate. As interviewees stated:

> *"WHY worry? Higher should be better. I signed the contract… bonus will only be given if I can outperform"* (Personal Interview, May 2007)

> *"I would be more concerned if the performance is too low from the benchmark rather than too high"* (Personal Interview, June 2007)

In other words, upside variability is irrelevant for the property fund managers in estimating risk. Apparently, this indicates that investors do not necessarily require a risk premium for upside variability. This strong negative response on upside variability also offers some explanation to why no evidence is evident by empirical studies to show that upside beta is priced.

However, approximately 30% of respondents hold the view that outperforming variability is a form of risk where this is most likely due to the demand to meet the expectations of investors. Some fund managers have a conservative or balanced investment strategy. A long-term stable and consistent performance is essential for them in order to meet the expectations of their fund investors. Some interviewees explained that

> *"I am worried if I perform too well in a year (say 20%) because if next year my performance is only 12%, which is still higher than my target (8%), my investors will be disappointed. I don't want my investors to feel upset with my performance in the next year."* (Personal Interview, May 2007)

> *"How do we ensure that over a period of time, we continuously move on (improve)...in a risky environment, you need to be consistent with your forecast."* (Personal Interview, May 2007)

In other words, these fund managers expect the performance of their funds to be consistent with their expectations. Therefore, extreme volatility is undesirable regardless of whether it is downside volatility or upside volatility. This signifies that even though downside risk is the only risk priced by the majority of property fund managers, there is no evidence to show downside risk is a perfect risk measure for all investors.

Interestingly, table 2 highlights that nearly 17% of all investors in the survey do not consider that the uncertainty of not achieving the target rate measures risk is a form of risk. Using the 'Benchmark' variable could perhaps be a valid explanation for this circumstance in which those respondents who do not have a benchmark for their organisation might not able to appreciate the underlying concept for the question. This can be demonstrated by the cross-tabulation in table 4.

(Insert Table 4)

Respondents without a benchmark tend to be less concerned with downside variability in which 60% of them selected 'no'. More importantly, the chi-squared statistic is statistically significant at 5% level. The contingency coefficient and Cramer's V both are also statistically significant at 5% which suggest that those respondents with and those respondents without a benchmark generally will give different answers. Thus, being unable to appreciate the underlying concept for the question is a reasonable explanation for this circumstance.

(Insert Table 5)

Conversely, table 5 shows that a benchmark does not have a far-reaching impact on respondents' opinions for upside potential. The insignificant chi-squared statistic, contingency coefficient and Cramer's V statistic show that the baseline results in table 3 are independent from the benchmark. In other words, there is no relationship between the respondents' perceptions towards upside variability and the benchmark.

Overall, the results indicate that a premium is required by investors for downside risk, while there is little evidence to support the view that investor need compensation for upside potential. This can also be used to explain why the empirical evidence clearly shows that downside beta is statistically significant. On the other hand, similar evidence does not exist for upside beta. This confirms that downside risk is an efficient risk measure because it is more consistent with investors' behaviour, where

this finding has been supported both empirically and qualitatively in that investors are more concerned about downside losses than the upside gains.

4.3 Understanding of Downside Risk

The previous section has demonstrated that downside risk is more consistent with how investors individually perceive risk. The results show that the investors are more concerned about underperforming rather than outperforming the benchmark. In this section the awareness of downside risk among property fund managers is also examined. One of the advantages of downside risk is that it is able to accommodate different risk tolerance levels of investors since the assumption that all investors have similar risk aversion levels, is debatable. Table 6 reveals that almost all respondents disagree with this argument.

(Insert Table 6)

Almost 93% of property investors either disagree or strongly disagree that all investors have similar risk aversion levels, in that different investors should have different risk tolerance level. This disputes the assumptions of mean variance analysis in which the utility function for all investors is in quadratic form. The results are similar to the analytical evidence from Arrow (1971) and Pratt (1964) in which quadratic utility function assumptions cannot precisely explain actual investor behavioural. This also provides further support for the use of downside risk, where it has been demonstrated by Nawrocki (1999) and Sing and Ong (2000) that different risk tolerance levels of investors can be accommodated by using downside risk.

(Insert Table 7)

Table 7 shows the importance of investors' risk aversion in estimating risk, with more than 90% of respondents agreeing that investors' risk aversion should be considered in estimating risk. However, 6.7% of respondents disagree with this statement with one explanation being that they do not believe that any risk measure can successfully incorporate this element. This scenario is clearly demonstrated in table 8.

(Insert Table 8)

Table 8 presents the average ratings for the importance of two risk measures in accommodating investors' risk aversion. The average ratings for both risk measures are around 2.6 where there is no substantial difference when comparing both risk

measures. This indicates that in general most property investors do not agree that these risk measures (i.e. downside risk and variance) can accommodate investors' risk aversion. This implies that more study or endeavour is required to demonstrate the theoretical superiorities of downside risk which in turn will increase the awareness of property investors.

There is another motivation for using downside risk as it does not require a normality assumption for return distributions. Hence, respondents were asked for their opinions on return distributions; in particular, are return distributions normally distributed? Table 9 exhibits the perceptions of property investors towards return distributions.

(Insert Table 9)

In response to this question only approximately 30% of respondents either disagree (16.7%) or strongly disagree (13.3%) that return distributions are normally distributed. In contrast, almost 47% of respondents agree and 6.7% respondents strongly agree with this statement. The strong agreement for this statement is inconsistent with the empirical evidence that has been documented by other researchers (Myer and Webb, 1993, 1994). The response from one of the interviewees could be a possible explanation for the divergence.

> *"No. It can't be (normal). In fact, it is very very hard to be normal. In my experience, it is skewed... So, I am saying from practical term; I don't think it is very normal. But, I will still use normal assumption and normal distribution. Otherwise, I am not going to finish…"* (Personal Interview, June 2007)

This confirms that many fund managers do not agree that real estate return distributions are normally distributed. However, many fund managers commonly use investment theories such as mean-variance analysis and CAPM which restrict analysis to the first two-moment assumption. In other words, the property fund managers have to use the normal assumption and assume that the real estate return distributions are normally distributed when doing their analyses, although they do not totally agree with this assumption.

There is another concern about the understanding of downside risk among respondents with and without a specified risk measure where the responses from these two groups could be different. Kruskal-wallies test was performed in order to examine the differences among the responses from these groups of respondents. The results are displayed in table 10.

(Insert Table 10)

Table 10 exhibits the differences in term of the responses from these groups of respondents to the understanding of downside risk. No substantial difference is observed by comparing the responses from these groups. The only exception is 'the agreement of all investors have similar risk aversion level' where the chi-square statistic is statistically significant at the 5% level. The respondents with a specified risk measure tend to "strong disagree" with the statement of all investors have similar risk aversion level, whereas the respondents without a specified risk measure would prone to "disagree" with this statement rather than "strong disagree". In short, no evidence is presented to support that there is a difference between these two groups of respondents on the understanding of downside risk.

In summary it appears that most property investors are not conversant with the theoretical superiorities of downside risk. Even though the limitations of variance are acknowledged by these property investors, they do not believe that downside risk measure can resolve these limitations. In other words, the theoretical assertions for downside risk are not accepted by practitioners. This supports the belief that more empirical tests on downside risk should be conducted and disseminated in order to increase the awareness of property fund managers towards downside risk.

4.4 Downside Risk Employment

The previous section has clearly showed the understanding and awareness of downside risk among property fund managers is relatively low. In this section the use of downside risk by Australian property funds is examined. In particular, respondents were asked for the reasons for employing and/or not employing downside risk.

(Insert Figure 4)

Figure 4 highlights the proportion of respondents who employ downside risk. According to the survey, 73% of respondents do not use downside risk; conversely 27% of respondents do utilise downside risk. This is inconsistent with the findings from figure 3 where only 4% of respondents employ downside risk. The explanations from some interviewees are that even though no formal downside risk measure is employed in estimating the downside risk of their investments, several informal ways to minimise downside risk are employed by Australian property fund managers. For example, sensitivity analysis and scenario analysis are employed in order to forecast the worst scenario for their investments. Some funds utilise the firm-specific characteristics such as gearing, management structure, quality of asset, size and liquidity variables in order to minimise the downside risk of their investments. Lee et al. (2007b) previously demonstrated that these variables have some relationships with downside systematic risk. Interestingly, this also implies that some fund managers are not fully understood about downside risk.

(Insert Figure 5)

The 27% respondents who employed downside risk were asked to answer why they use the downside risk. The results are depicted in figure 5 where it shows that "suitable with the risk management plan" as the key motivation for many property fund managers to employ downside risk. However, its recognition as "a superior risk measure" and "it is ease and convenience of use" are reasons put forward by some property funds. Some property funds use it for cross-checking purposes. This confirms that property fund managers view that minimising the downside risk of their investments is essential where taking steps to minimise downside risk is consistent with the risk management of their funds.

(Insert Table 11)

Table 11 highlights the reasons for not using downside risk measure among property investors who do not use downside risk (73%). The most common reason is "unfamiliarity of downside risk" in which many property fund managers prefer to employ popular risk measures such as variance rather than unpopular risk measures. A large proportion of investors cited other significant factors for not employing downside risk including "not suitable with their risk management plan" and "lack of awareness with its theoretical superiorities". Other reasons that were pointed out by respondents are "it is not required by clients" and "no reason to use it". In other words, they cannot see any economic benefits for using it.

Interestingly, no respondent agree that the intractability and complexity of downside risk measure are causes for impeding them from employing downside risk. This indicates that even though fund managers are more comfortable with the traditional risk measures, it does not mean that they are reluctant to accept new risk measures such as downside risk measure due to the complexity of the measures. Nevertheless, lack of familiarity could be the main reason for resistance among property fund managers to the downside risk measures.

(Insert Figure 6)

This group of respondent was also asked to response whether they would consider the use of downside risk measure in the future. As depicted in figure 6, generally, many (45%) of respondents are unsure whether or not they will employ downside risk measures in the future. Among them, 23% of respondents clearly indicated that they do not have any intention of utilising it in the future. In contrast, the future

employment of downside risk is only applicable to approximately one third of respondents. It must be noted that its future employment is subject to the significance of its economic meaning. It is most succinctly voiced by one interviewee:

> *"if… in the future, I am requested by my clients to show them the downside risk of their investments…then, I will have to use it."* (Personal Interview, May 2007)

In other words, the lukewarm attention of investors to the downside risk of their investments has undermined its economic value. It should be noted that the recent US sub-prime mortgage crisis and the collapse of several property funds in Australia could create awareness by investors to the importance of measuring the downside risk of their investments.

4.5 CONCLUSION

The attractiveness of downside risk has been demonstrated by extensive empirical and analytical studies. Importantly, these studies confirm that downside risk is the only applicable risk for investors. However, there is a growing concern on there could be a gap between practice and theoretical assertions. This paper attempts to fill in the gap by examining the perceptions of property fund managers towards risk.

There are several important findings from this study. First, variance-framework risk measures are the popular risk measures among property fund managers. Second, downside losses emerge as the only risk for most property investors where this can be used to explain why downside beta is priced. Generally, property fund managers require a risk premium for downside losses, although in direct contrast there is no evidence to show they require compensation for upside potential. This provides further support for the empirical evidence in prior studies where investors are more concerned with the downside volatility rather than upside. Therefore, it is not surprising that there is no empirical support for upside beta as well as beta in which beta measures both upside and downside volatilities.

Third, the results appear that there is a disparity between theory and practice. Although fund managers agree that downside losses are risks for their investment, they are more concerned with the economic meanings of employing downside risk. In other words, the theoretical assertions about downside risk from the empirical and analytical analyses are not accepted by property investors. Additionally, the understanding or awareness of downside risk among the Australian property fund managers is still relatively low.

The implications from the paper are that sustain efforts from researchers and educators in promoting and demonstrating the advantages of downside risk are crucial where downside risk is a favourable risk measure which is consistent with how investors individually perceive risk. Moreover, extreme high upside variability

appears to be applicable risk measure for some property fund managers. Therefore, researchers could contribute towards modifying the downside risk measure in order to make it more generally applicable for all practitioners. Given the recent US sub-prime mortgage crisis, a survey of property mortgage funds on the issue of downside risk materialises as a rapidly growing and essential future research direction.

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Table 1: Asset Class Performance Analysis: December 2006 (Annualised Return)

Market	1Y	3Y	5Y	10Y
Share (ASX All Ordinaries)	24.97% (2)	24.51% (2)	15.50% (2)	13.11% (2)
Direct Property (Australian Composite Property)*	17.29% (3)	14.48% (3)	12.96% (3)	11.68% (3)
LPTs (S&P/ASX LPT 300)	34.05% (1)	25.93% (1)	19.43% (1)	16.07% (1)
Bonds (CBA Bond: All Series, All Maturities)	2.46% (4)	6.07% (4)	5.60% (4)	6.33% (4)

Source: IPD/PCA (2007)

Note: Parenthesis shows the rank and (*) Australian Composite Property return is represented by the IPD/Property Council Investment Performance Index.

Figure 1: Organisation

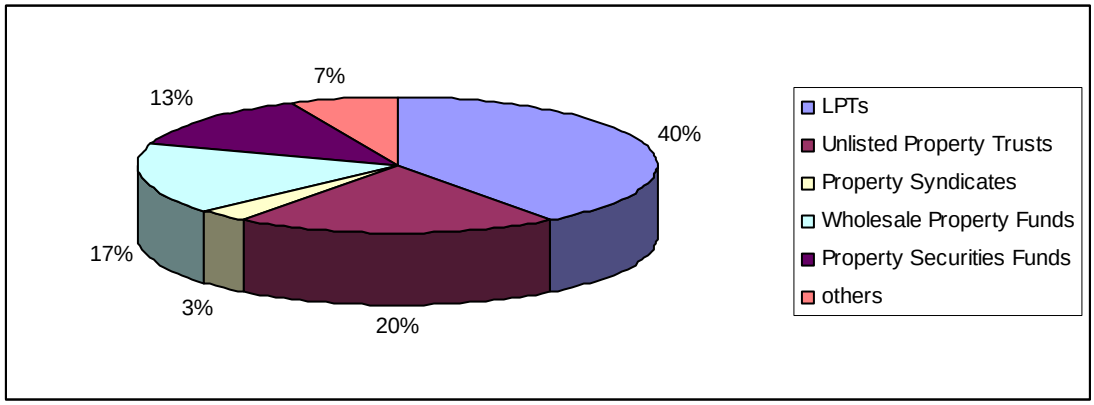


Figure 2: Benchmark of the Organisation

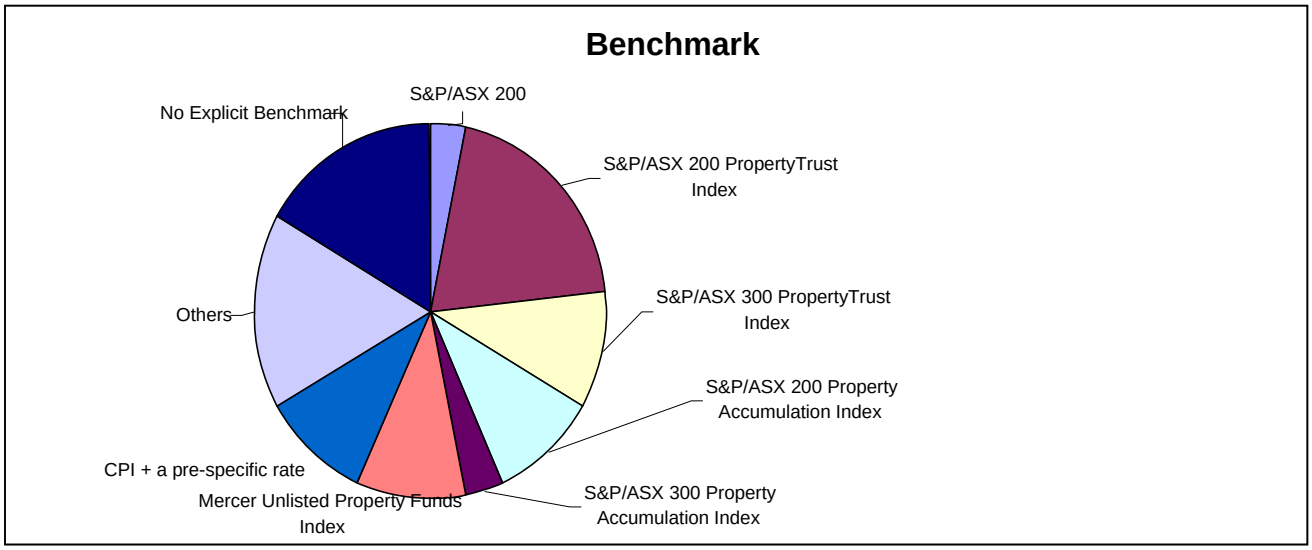


Figure 3: Employed Risk Measures by Property Funds

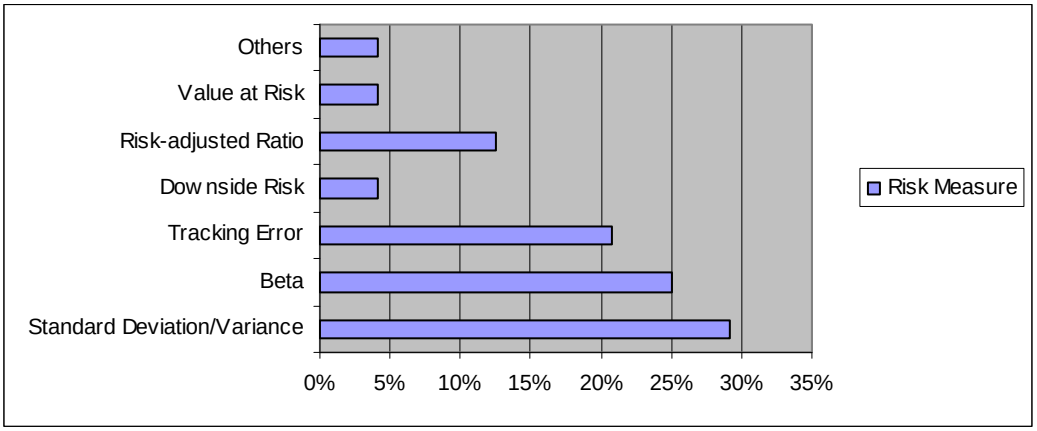


Table 2: Investors' Perceptions towards Downside Risk

Response	Worry Performance Below Target Rate
Yes	80.0%
No	16.7%
Unsure	3.3%
Total	100%

Table 3: Investors' Perceptions towards Upside Potential

Response	Worry Performance Above Target Rate
Yes	30.0%
No	63.3%
Unsure	6.7%
Total	100%

Table 4: Cross-Tabulation between Investors' Perceptions toward Downside Risk and the Benchmark

Response	With Benchmark	Without Benchmark	Total
Yes	73.3%	6.7%	80.0%
No	6.7%	10.0%	16.7%
Unsure	3.3%	0%	3.3%
Total	83.3%	16.7%	100%
Chi-squared statistic-8.160* Contingency Coefficient-0.462* Cramer's V-0.522*			

Note: * indicates significance at 5% level; ** indicates significance at 1% level

Table 5: Cross-Tabulation between Investors' Perceptions toward Upside Potential and the Benchmark

Response	With Benchmark	Without Benchmark	Total
Yes	30.0%	0%	30.0%
No	46.7%	16.7%	63.3%
Unsure	6.7%	0%	6.7%
Total	83.3%	16.7%	100%
Chi-squared statistic-3.474 Contingency Coefficient-0.322 Cramer's V-0.340			

Note: * indicates significance at 5% level; ** indicates significance at 1% level

Table 6: Similar Risk Aversion Level

Response	The Importance of Risk Aversion
Strongly Agree	0%
Agree	0%
Unsure	6.7%
Disagree	33.3%
Strongly Disagree	60%
Total	100%

Table 7: The Importance of Risk Aversion in Estimating Risk

Response	The Importance of Risk Aversion
Strongly Agree	66.7%
Agree	26.7%
Unsure	0%
Disagree	6.7%
Strongly Disagree	0%
Total	100%

Table 8: The Importance of Risk Measures in Accommodating Investors' Risk Aversion

Risk	Average Rating
Variance	2.633
Downside Risk	2.600

Table 9: Return Distributions are Normally Distributed

Response	Return Distributions are Normally Distributed
Strongly Agree	6.7%
Agree	46.7%
Unsure	16.7%
Disagree	16.7%
Strongly Disagree	13.3%
Total	100%

Table 10: Differences between the Respondents on the Understanding of Downside Risk

Responses	Chi-Square
All investors have similar risk aversion	5.303*
The importance of risk aversion	0.906
Variance and risk aversion	2.415
Downside risk and risk aversion	0.382
Normal distribution assumption	0.664

Note: The test was performed by Kruskal-Wallis test. * indicates significance at 5% level; ** indicates significance at 1% level

Figure 4: Downside Risk Employment

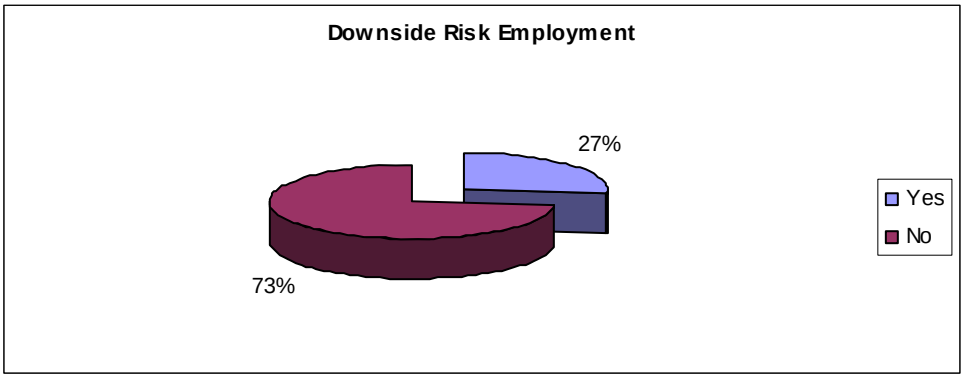


Figure 5: Key Motivations for Employing Downside Risk

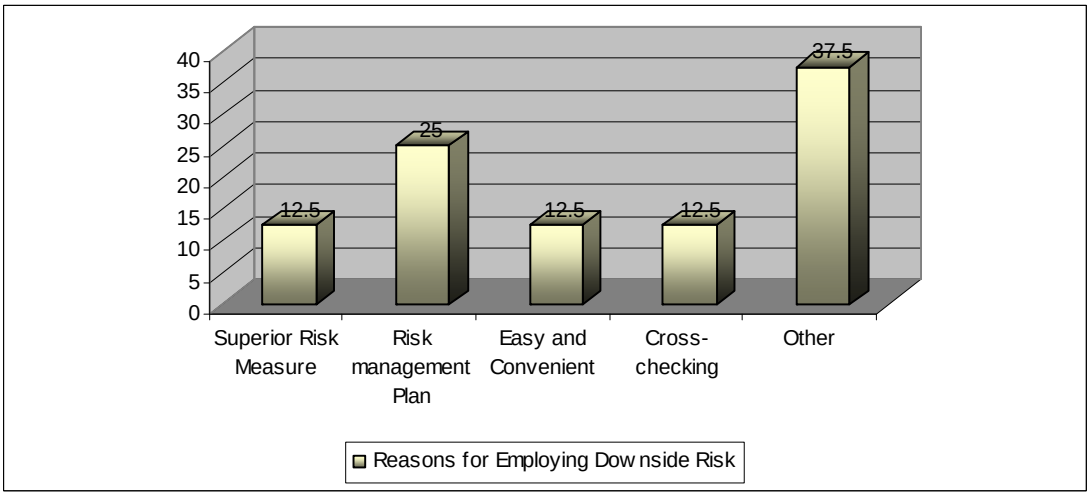
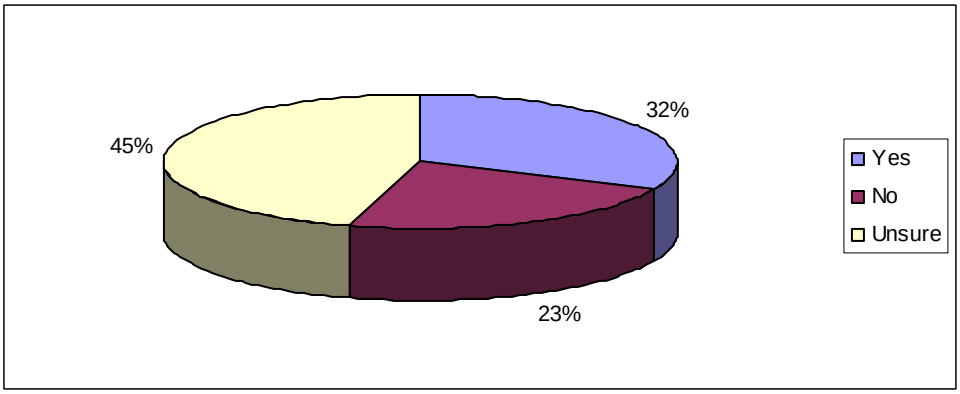


Table 11: Reasons for Not Utilising Downside Risk

Reasons	Percentage
Not suitable with their risk management plan	27.3%
Lack of awareness with its theoretical superiorities	18.2%
Unfamiliarity of downside risk	36.4%
Complexity of downside risk	0.0%
Others	18.2%
Total	100%

Figure 6: Future Downside Risk Employment



Appendix I: Non-response Analysis

Variables	Early Respondents (Wave 1) and Non-respondents (Wave 2)			
	Wave 1 (n=18)	**Wave 2 (n=12)**	**Mean Difference**	***P*-value**
Organisation	2.778	2.583	0.194	0.789
Outperforming benchmark	1.500	1.167	0.333	0.067
Standard deviation	0.278	0.167	0.111	0.498
Beta/CAPM	0.278	0.083	0.194	0.205
Tracking error	0.111	0.250	-0.139	0.334
Downside risk	0.000	0.083	-0.083	0.227
Risk-adjusted ratio	0.167	0.000	0.167	0.146
VaR	0.000	0.083	-0.083	0.227
No explicitly risk measure	0.556	0.417	0.139	0.473
Others	0.000	0.083	-0.083	0.227
Heard about downside risk	1.278	1.000	0.278	0.047*
Worry below target rate	1.222	1.250	-0.028	0.885
Worry above target rate	1.778	1.750	0.028	0.898
Similar risk aversion level	1.556	1.333	0.222	0.352
Importance of risk aversion	4.556	4.500	0.056	0.859
Variance and risk aversion	2.556	2.750	-0.194	0.622
Downside risk and risk aversion	2.389	2.917	-0.523	0.176
Normal distribution	3.222	3.083	0.139	0.763
Downside risk is more sensible	3.056	3.583	-0.527	0.087
Downside risk employment	1.833	1.583	0.250	0.136
Employing downside risk	3.333	3.400	-0.067	0.960
Not employing downside risk	2.333	3.287	-0.953	0.141
Downside risk future employment	2.000	2.423	-0.429	0.303

Note: * significance at 5% level, ** significance at 1% level.