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AREIT returns from 1990 – 2008: A multi-factor approach

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Extended Abstract: Australian Real Estate Investment Trusts (AREITs) have experienced substantial growth and popularity since 1993. Amongst the major themes surrounding this sector during this time, were the increased attention from institutional investors, the trend towards and away from property-type diversification, significant merger and acquisition activities which led to increased trust size, the debate between internally versus externally managed trust structures, increased gearing levels, and the focus towards diversification into international property assets. While the AREIT sector had benefit from the increased flow of funds from institutional investors during the 1997 Asian financial crisis, the recent impact of the 2008 global financial crisis has been a negative one, as increased credit margins meant that AREITs found it harder to access capital.

Our paper aims to study the sensitivities of annualised AREIT returns from 1990 – 2008 towards a set of seven firm-specific variables and five market-wide risk variables. In particular, we examine the time-varying and cross-sectional differences between the impact of firm size, the degree of leverage, market-to-book ratios, property-type diversification, international diversification, the proportion of institutional investment, and management structure. Our set of market time-varying market risk indicators include, overall Australian market conditions proxied using the S&P/ASX200 Index, yields on 90-day bank Treasury Notes to represent the short-term interest rate, yields on10-year Treasury Bonds to represent the long-term interest rate, and changes to the USD/AUD exchange rate to represent exchange rate risk components.

We apply panel regressions for fixed and group effects onto balanced and unbalanced panels, categorised according to three sub-periods to study the major phases of the evolution of the AREIT sector. Our regression results find that the size effect has had a negative impact of returns, but this effect has been diminishing over time. Overall market risk was found to be significant and positive only since 2003, suggesting that more recently, AREITs behave more like stocks and less like defensive assets. Additionally, the relationship with exchange rate risks has been positive in recent years, due to more AREITs choosing to diversify internationally, particularly in the U.S. property markets.

Our findings on the relationship between market-to-book ratios and AREIT returns depart from standard finance literature. It appears that the market places a premium on AREITs with higher market-to-book ratios. Compared to REITs in other countries, earlier preference for AREITs diversified across property-types have appears to shift towards greater specialisation. We also find contrasting evidence on the impact of international diversification, and that domestic AREITs provided better returns than internationally diversified counterparts. This may be largely due to the fact that the AREITs classified as internationally diversified, primarily held assets in the U.S. rather than from a range of countries. We suggest that perhaps the difficulties in accessing economies of scale in the management of such off-shore properties have precluded these AREITs from holding a more geographically diversified property portfolio.

The sensitivities of AREIT returns towards short-term and long-term interest rates also warrant further investigation. Our results are similar to another recent Australian study, but inconsistent with much of the existing literature. The relationship between returns and short term interest rates was found to be positive and significant before 2002, and the relationship with long-term interest rates was found to be negative and significant since 2003, indicating that AREITs exhibit less bond-like characteristics in the past five years.

Keywords: *AREITs, AREIT returns, property-type diversification, international diversification, panel regressions*

1.0 INTRODUCTION

Australian Real Estate Investment Trusts (AREITs) have experienced substantial growth and popularity in the past fifteen years. Australia has the highest proportion of securitised property relative to other markets, and is the leading investor in global direct property. Introduced in the U.S. in the 1960s, the U.S. now comprises 54% while Australia comprises 15% of the global REIT market. The AREIT sector grew substantially after 1993, due to the crash of the unlisted property sector. The main theme at this stage was for AREITs to be specialised into property-type sectors, such as retail, industrial and commercial properties. By 1996, the flow of funds and new listings in the sector were led by major Australian life insurance companies and investors broadened appetites into newer property-type classes, such as hotels, entertainment outlets and overseas property. The Asian financial crisis of 1997 saw more funds flowing into the AREIT sector from the general equity market, mostly from large institutional funds as they were viewed to be "safer" investments with lower volatilities. However, only the large AREITs worth more than $1 billion received such attention. From 1998 to 2000, smaller AREITs were driven to increase their sizes to attract institutional investors and decrease their costs of capital. A series of mergers and acquisitions marked this period, and there was a debate between adopting internal or external management structures (Brenchley, 2001).

Between 2000 to 2007, AREITs continued to consolidate and internalise. By then, most of the high-quality property assets within Australia were already securitised. Moreover, lower interest rate levels led to increased gearing and internally managed trusts with lower costs of capital and higher competitive advantage were able to conduct more takeovers that would have otherwise diluted their capital structures. Consequently, larger and stronger AREITs found it better to takeover smaller AREITs and their assets rather than to acquire property asset directly (Meijer et al., 2007). Additionally, a new trend for international diversification emerged, and AREITs looked to acquire properties in the U.S., New Zealand, Europe and Asia. The driving force for this was strong capital inflow from Australia's Compulsory Superannuation Scheme and the preference of the ageing population for stable income streams and preservation of invested capital. By 2005, the Australian securitised property sector had absorbed 12% of superannuation's AUD650 billion capital injection into the capital markets. The credit crunch and global financial crisis of 2008 has had an adverse impact onto the AREIT sector. In 2000, average AREIT gearing levels were approximately 15 – 20% of total assets but low interest rates and increased use of debt saw a rise in gearing to 44% in 2007. International AREITs have significantly higher debt levels than domestic ones, some more than 50% of total assets compared to 44% for domestic counterparts. Internally managed AREITs had lower gearing levels of 35.7% compared to externally managed ones with 44.5%. Commercial trusts had the highest gearing levels, between 50 – 55%, followed by industrial and retail trusts of between 40 – 45%. Comparatively, those that diversify across property types had average gearing of between 30 – 35%. The increase in credit margins for corporate debt has put pressure on obtaining credit, and this has had a negative impact on AREIT returns.

This paper aims to examine the determinants of AREIT returns from 1990 till 2008, using explanatory variables based on firm characteristics and overall market indicators. The explanatory firm variables applied are: firm size, the degree of leverage, market-to-book value ratios, property-type diversification, international diversification, the proportion of institutional investment, and management structure. Our set of market indicators include: the returns overall Australian equities, the short-term interest rate, the long-term interest rate, and changes to the exchange rate. We control for the 2008 global financial crisis by including a dummy variable, and we examine both balanced and unbalanced panels for three sub-periods.

The plan of this paper is as follows. Section 2 reviews the relevant literature on the performance of REITs. Section 3 outlines the panel regression method used to estimate time-varying and cross-sectional partial regression coefficients for both balanced and unbalanced panels with fixed effects. We also examine the data used in our sample in this section. Section 4 presents the empirical results of our study, and some concluding remarks are given in Section 5.

2.0 LITERATURE REVIEW

According to the CAPM, systematic risk should be the only relevant factor in explaining the variations in asset returns. However, Fama and French (1992) noted that the influence of the market beta has been diminishing over time. Later studies suggested for the inclusion of a global market risk factor in explaining the return of REITs that diversify internationally, along with country-specific and firm-specific variables (Ling and Naranjo, 2002; Bond et al., 2003).

Cross-sectional analyses on REIT returns have found that firm attributes such as size, book-to-market ratios, leverage, and asset structure play a significant role in explaining the behaviour of REITs. For the size factor, theory suggests an inverse relationship between returns and size, implying that smaller REITs tend to

outperform larger REITs. Smaller REITs are traded more infrequently and this would cause a downward bias for the estimated betas. Larger REITs are found to be more geographically diversified and also less diversified across property types (Chaudhry et al., 2004; Hamelink and Hoesli, 2004). Stocks with high market-to-book ratios are regarded as growth stocks and those with low market-to-book ratios are regarded as value stocks. Value stocks are expected to outperform growth stocks. Hamelink and Hoesli (2004) have observed that the significance of the value factor has been increasing for REITs since 1990 and plays an even more important role when REITs diversify across continents rather than across countries.

The degree of leverage has been found to be significant and positive in differentiating between the cross-sectional returns of REITs. Allen et al. (2000) find that leverage magnifies both positive and negative investment returns, creating pronounced gains and losses. Also, REITs with more leverage are more sensitive towards macroeconomic factors. The relationship between returns and short term interest rates is expected to be inverse. Increasing interest rates may lead to higher financing costs and affect the demand for property assets, since these investments rely heavily on borrowed funds. Finance theory also suggests that investors demand their required rates of return from a risk-free return plus a risk premium and so, increasing interest rates may lead to increased required rates of return and subsequently, lower valuations of REITs. However, the negative relationship be debatable because of the underlying forces that drive interest rate movements. An episode of decreasing interest rates may be a symptom of weaker economic conditions and lower inflationary expectations. Such environments may cause property prices to fall, and increased rental vacancies, thus lowering the income streams of REITs. Therefore, there may be a positive relationship between returns and long term interest rates. The findings of Delcoure and Dickens (2004) agrees with Allen et al. (2000) but using an Australian sample from 2000 – 2005, Ratcliffe and Dimowski (2007) find the opposite, that there is a significant negative relationship between long term interest rates and returns, and a positive but insignificant relationship with short term interest rates.

Studies that have examined the impact of property-type diversification have provided contrasting evidence. Earlier U.S. studies have found that diversified REITs have higher risk levels, lower profit margins, highest average general and administrative expenses, lowest ratio of rental to total income and greater sensitivity towards market betas (Capozza and Seguin, 1999; Ambrose and Linneman, 2001). However in Australia, Hedander (2005) finds a statistically significant positive relationship between specialisation and value, concluding that while AREITs were more diversified during the 1990s, subsequent negative attitudes by the overall market towards diversification has seen AREITs adjust property portfolios to be more specialised on fewer property types. Another study by Ratcliffe and Dimowski (2007) agrees, finding specialised AREITs more sensitive towards market returns, while diversified AREITs are able to smooth the cyclicality of property sector returns, hence reducing systematic risks.

Other studies have examined the benefits of international diversification such as those of Ling and Naranjo (2002) and Bond et al. (2003). Poor correlations between countries should provide higher returns for internationally diversified REITs. However, these studies did not consider the implications of exchange rate risk which can substantially reduce returns especially when international diversification involved investments made in a single foreign country. Currency conversion has been found to consistently amplify risk and a investing domestically would be least risky regardless of asset type or country. Evidence for this was presented from a U.K. and Japanese perspective by Ziobrowski and Curcio (1991) and Worzola (1995) and from an Australian perspective by Newell and Webb (1996). For AREITs that invest substantially into overseas markets such as the U.S., Europe and Asia, an appreciation of the Australian dollar would have a negative impact onto the income stream and therefore a negative relationship is expected towards returns. Newell and MacIntosh (2007) provide a case to include unexpected changes to exchange rates as a factor in a multifactor pricing model, since internationally diversified AREITs actively engage in currency risk management.

Some studies have investigated if internalising REIT management offers greater efficiency and higher returns. Intuitively, an internally managed structure should have reduced agency costs. Capozza and Seguin (1999) and Allen et al. (2000) find that the interests of owners and management are aligned for internally managed REITs, and that they are less sensitive towards market risk than externally managed ones. Tan (2004) provide similar evidence from the Australian perspective and suggest that the internalisation was motivated by the desire to diversify into property development activities, to reduce agency costs, to lower costs of capital, to avoid fee leakage and to improve management efficiency. The impact of institutional investor ownership in REITs has been comprehensively studied by Wang et al. (1995) who find that REITs with lower levels of institutional ownership significantly underperformed the general stock market during 1970 till 1989. Since the REIT market was considered to be less informationally efficient compared to the general stock market prior to 1990, there was a strong positive correlation between performance and the

number of security analysts following REITs with a large proportion of institutional ownership. These results indicate that the performance of REITs is positively affected by the increased flow of information. Downs (1998) also finds that higher levels of institutional ownership enhance REIT returns. In a recent study on Australian industry-based superannuation funds, Newell (2006) finds that these institutional investors have been significant contributors of capital into the AREIT and direct property sectors and much of the outperformance of these funds can be attributed to the focus of investment strategy into the property sector.

3.0 METHODOLOGY AND DATA

Our panel estimations take the following form, as suggested by Ooi and Liow (2004):

$$R_{it} = \alpha + \beta F_{it} + \gamma M_t + \varepsilon_{it} \qquad (1)$$

where the dependent variable R_{it} denotes the return of asset i at time t. F_{it} is the vector of explanatory firm-specific variables, and will vary according to asset i, over time. The vector of time-varying market risk indicators is denoted as M_t. This specification denotes α as a fixed intercept, while β and γ are column matrices of the partial coefficients for the set of explanatory variables in the estimation model. The error term ε_{it} can be specified as $\varepsilon_{it} = \mu_i + \nu_{it}$ where the first term accounts for any unobservable firm-specific effects that is not included in the regression model and the second term represents the remaining disturbances that can vary with individual assets and over time. The estimation model of Equation 1 assumes the error term is fixed for each company over the sample period to represent the effects of any omitted variables unique to each company that remain constant over time. One way to estimate this is to assume dummy variables in the regression model. The fixed-effects model can now be specified as:

$$R_{it} = \alpha_i + \beta F_{it} + \gamma M_t + \varepsilon_{it} \qquad (2)$$

where α_i is a unique intercept for each individual asset in the sample. Equation 2 estimates a common set of partial regression coefficients while allowing varying intercepts for each cross-sectional unit.

To test the significance of group effects, we can test the hypothesis that the constant terms are all equal with an F test. The null hypothesis assumes pooled least squares are the efficient estimator. The F-ratio used for the test as suggested by Greene (2000, p. 562) is:

$$F(n-1, nT-n-K) = \frac{(R_U^2 - R_P^2)/(n-1)}{(1-R_U^2)/(nT-n-K)} \qquad (3)$$

where n denotes the number of groups in the sample, T denotes the total number of temporal observations and K represents the number of explanatory variables applied in the model. The subscripts U and P indicate an unrestricted model and a pooled/ restricted model with only a single overall constant term. If there are significant improvements in the R^2, then it can be concluded that the group effects are statistically significant. The estimated coefficients from equation 2 assume a balanced panel of sample firms over time but a common problem in panel datasets is missing data. Panels whereby the group sizes vary over time are not unusual. These panels are called unbalanced panels and when panels are unbalanced, adjustments to the total counts are made for the computation of the F-ratio, the estimated coefficients and the standard error. Instead of nT to account for the total number of observations, $\sum_{i=1}^{n} T_i$ is used instead.

The explanatory variables in Equation 2 are categorised into F_{it}, a vector of seven explanatory firm-specific variables, and M_t, a vector of five time-varying market risk indicators. We formulate our hypotheses based on the literature reviewed in the previous section. In the set of firm-specific variables, size is measured with the natural log of market capitalisation (in AUD million). Empirical evidence suggests that there is an inverse relationship between returns and size and this implies that returns of smaller AREITs should outperform larger AREITs. Leverage is represented by the debt-to-equity ratio. There should be a positive relationship between the leverage and returns, as higher debt levels entail higher risks for investors. AREITs with high market-to-book ratios are regarded as growth assets, and we expect a negative relationship between returns and the market-to-book ratio. In asset pricing, the premium attached to value assets indicates that investors require higher returns from assets with lower market-to-book ratios. We measure the impact of institutional ownership using the percentage of institutional investors on the firm's issued equity. Greater involvement of institutional investors should result in reduced agency costs and therefore greater returns. Management

structure is measured using a dummy variable, taking a value of 1 for an internally managed AREIT, and a value of 0 for an externally managed one. Internally managed AREITs have less agency costs, and greater economies of scale, so we expect a positive impact of internal management with AREIT returns. To measure the effect of diversification strategies, we use the Hirschman-Herfindahl Index (1964), which is the sum of the squared weights invested in various property-type sectors. A coefficient of 1 indicates a specialised AREIT, and a coefficient close to zero indicates an AREIT diversified across property sectors. There should be a negative relationship between returns and specialisation. We hypothesise that diversified AREITs should provide higher returns. Geographical diversification is measured in a similar manner, by using the sum of the squared weights invested in Australian property. A coefficient of 1 indicates a domestic AREIT, and a coefficient close to 0 indicates an internationally diversified AREIT. If there are gains from diversification, there should be a negative relationship between domestic focus and returns. This would imply that internationally diversified AREITs should provide greater returns.

In our set of time-varying market risk indicators, short-term interest rates were measured using the yields on 90-day Treasury Notes. We expect a negative relationship between short-term yields and AREIT returns. We used the yields on 10-year Treasury bonds to represent long-term interest rates, and expect a positive relationship between with AREIT returns. To represent general market conditions, we use the S&P/ASX200. AREIT returns should be directly influenced by systematic market risk. Changes to the USD/AUD exchange rate was used to examine the sensitivity of internationally diversified AREITs towards exchange rate risk. The majority of international AREITs have substantial investment in the U.S. property markets and so we have only included the singular impact of this exchange rate risk. There should be a positive relationship between changes to the exchange rate and the returns of internationally diversified AREITs. A dummy variable to represent the 2008 global financial crisis was also included in our analysis, taking a value of 1 in the year 2008, and 0 otherwise. We expect a negative coefficient between returns and the dummy variable.

Table 1: Summary statistics AREITs from 1992 - 2008

Year	# of AREIT	Annual return	Median market size	Debt-to-equity ratio	Market-to-book-value	# diversified AREIT	# International AREIT	# Internally managed	% Institutional owners
1992	4	-0.0752	488.24	0.1320	0.7475	3	0	3	0.2096
1993	6	0.2432	146.89	0.1832	0.7200	4	0	3	0.2016
1994	9	1.0293	153.63	0.2152	0.8967	5	0	3	0.1568
1995	9	0.0360	184.92	0.2928	0.8867	6	0	4	0.1360
1996	9	0.0978	297.22	0.2431	0.9911	5	0	4	0.1351
1997	10	0.0603	383.64	0.3208	1.1230	6	0	4	0.0980
1998	14	0.0453	301.78	0.3324	0.9736	6	0	5	0.2283
1999	21	-0.0499	361.09	0.4398	1.0505	8	0	10	0.2059
2000	22	-0.0250	367.44	0.4586	0.9145	8	0	11	0.1795
2001	22	0.0286	366.61	0.5481	0.9445	7	1	11	0.0979
2002	23	0.0146	498.62	0.5726	0.9983	8	1	12	0.0728
2003	31	0.0893	329.91	0.6120	0.9858	10	2	16	0.1422
2004	37	0.1867	376.79	0.7181	1.0246	16	7	18	0.2167
2005	49	0.1030	352.71	0.8412	1.1179	21	16	23	0.1745
2006	56	0.1820	453.48	0.8035	1.1959	23	25	27	0.2169
2007	58	-0.1126	650.37	0.8839	1.1205	29	32	26	0.2186
2008	54	-1.3082	285.52	0.9660	0.5413	29	30	24	0.1880

Our study examines 54 AREITs from 1990 until 2008. The sample includes AREITs that have since delisted or were suspended. As long as there were more than two years of data available, they qualified for inclusion in our sample. We also categorised the data into three sub-periods. Period 1 covers 1991 till 1996, which has been described as the emergence of the AREIT sector following the collapse of the unlisted property trust sector. Period 2 covers 1997 till 2002, which had been characterised by a larger number of merger activity, increased capital inflow from the superannuation industry, and the increasing trend towards internalising management structures. Period 3 covers 2003 till 2008, where the major theme was increased gearing levels and for AREITs to diversify internationally. This period also includes the heighted phase of volatility in the global financial markets, stemming from the U.S. financial crisis.

Monthly AREIT returns, market capitalisations, debt-to-equity ratios and the proportion of institutional ownership were derived from Datastream. We sourced the annual diversification strategy profiles from annual financial reports provided by Aspect Huntley. Table 1 reports the summary statistics of these firm characteristics. In addition, monthly returns for the S&P/ASX200 Index was sourced from Datastream, the yields on 90-day Treasury notes and10-year Treasury bonds as well as the USD/AUD exchange rate was derived on a monthly basis from the Reserve Bank of Australia. Our sample statistics confirm the findings of earlier literature on the increasing size of AREITs and the levels of gearing over time. Although there has been an increase in the overall number of AREITs in recent years, the preferred diversification strategy since 2003 has been towards international diversification, rather than diversification across property-types. We discuss our results in the next section.

4.0 RESULTS

We estimated the fixed-effects regression model specified in equation 2 on both balanced and unbalanced panels over each of the three sub-periods using Stata. Our results are presented in Table 2. The F-ratios for the overall and sub-period regressions using both balanced and unbalanced panels suggest the significance of group effects within our model. The crisis dummy was only included in the regressions that included the 2008, and as expected, was found to be significant at the 5% level.

Our results indicate that the size factor had a negative impact on returns but only for Period 1 and Period 2. Size was only found to be a determinant of returns before 1996. This suggests that other firm and market factors provide explanation for the variation of cross-sectional returns of AREITs. The decrease in explanatory power due to size may also be partially explained by the earlier observation that much of the size increases in surviving AREITs have been due to the acquisitions of smaller trusts by larger ones, rather than the addition of new property assets. The level of gearing was found to have an overall positive impact towards returns, but this only applied to the balanced panel during Period 3 at the 5% level. The results for market-to-book ratios were inconsistent with the hypothesised negative coefficient. The coefficients were positive through all sub-periods and under the balanced regressions, showed significance at the 1% level during Periods 1 and 3. It would appear that a premium was attached to growth AREITs, rather than value AREITs. The proportion of institutional ownership had an overall positive but insignificant impact onto returns. Because institutional investors focus primarily on much larger AREITs, the benefits of institutional involvement in this sector may not have been fully experienced by two-thirds of the firms in the sample. The impact of internalising management structures was only estimated in Period 2, and not found to enhance returns.

Results for the case of diversifying across property-types have been consistent with the findings of Hedander (2005). The coefficients were negative in Periods 1 and 2, but not significant, whereas more specialised AREITs provided better returns in Period 3. Although AREITs were more type-diversified prior to 2000, the subsequent negative attitudes by the overall market towards this trend had seen AREITs adjust their property portfolio to be more specialised. The results for geographical diversification are in contrast with our hypothesis. We find that domestic AREITs provide better returns than internationally diversified ones and the results were significant at the 1% level in Period 3. The ineffectiveness of international diversification strategies for AREITs should be mostly attributed to the fact that most of these AREITs expand to a singular market, namely the U.S., rather than maintain a diversified strategy across many countries. Perhaps the difficulties in accessing economies of scale in managing these off-shore assets have precluded these AREITs from involving a greater variety of geographically placed investments.

The S&P/ASX200 as an overall indicator for market conditions was only found to be significantly positive in Period 3. This can be attributed to the increased integration between the AREIT sector and the overall equity market from 2003. Moreover, the coefficients for the balanced and unbalanced regressions indicate an amplified effect of systematic market risk towards AREIT returns. One explanation for this, would be that when market conditions are favourable, property asset values and rental returns from tenants experience positive growth. The evidence from Period 3 is indicative that AREITs in recent years behave more like stocks and less like bonds.

The impact of short-term interest rates onto AREIT returns was found to be positive and significant in Period 2, whereas the impact of long-term interest rates was found to be negative in the unbalanced panel of Period 3. Our results, although not consistently significant, departs from the previous hypotheses and much of the literature, but can be compared with the findings of Ratcliffe and Dimowski's (2007) who found an insignificant positive relationship with short-term interest rates, and a significant negative relationship with long-term interest rates. It may be beneficial to investigate in detail the debt components of AREITs, and how the choice of debt funding has had an impact onto the interest rate sensitivities of AREIT returns.

Our results for the impact of exchange rate risk in determining AREIT returns were consistent with our previous hypothesis. A depreciation of the Australian dollar has a direct relationship with AREIT returns and we find this relationship significant at the 5% level in the unbalanced regression of Period 3.

Table 2: Determinants of AREIT returns from 1990 - 2008

	Unbalanced Panels				*Balanced Panels*		
	Full Sample 1990 - 2008	Period 1: 1991 - 1996	Period 2: 1997 - 2002	Period 3: 2003 - 2008	Period 1: 1992 - 1996	Period 2: 1999 - 2002	Period 3: 2004 - 2007
# of firms	64	10	24	62	9	20	43
# of observations	446	54	116	284	36	80	172
R-squared	0.3746	0.0427	0.0023	0.596	0.0607	0.0147	0.7287
F-value	24.10***	138.37***	2.61**	28.26***	4.71***	8.29***	35.12***
Firm size	-0.0069	-1.7014	-0.0814	0.1086	-7.1826	-0.0766	0.0377
	(-0.12)	(-3.11)**	(-0.87)	(1.28)	(-4.45)***	(-0.50)	(0.53)
Debt-equity ratio	0.0415919	1.58385	-0.0837107	0.0075997	-0.6953959	-0.0376454	0.0941617
	(0.47)	(1.66)	(-0.81)	(0.10)	(-0.25)	(-0.32)	(2.02)**
Market-to-book value	0.1024415	3.574604	0.0629441	0.1215769	12.58625	0.0997338	1.031998
	(1.78)*	(3.03)**	(0.60)	(1.74)*	(3.74)***	(0.48)	(4.75)***
Property type diversification	0.5399313	-0.2657	-0.6050513	0.9557928	-2.952067	-1.730342	0.514493
	(2.13)**	(-0.19)	(-1.08)	(2.14)**	(0.93)	(-2.06)*	(1.24)
International diversification	0.4501317	---	0.074249	0.6795963	---	-0.1713184	1.094235
	(1.70)*	---	(0.62)	(2.76)***	---	(0.96)	(4.73)***
Institutional ownership	0.2678666	-1.843665	-0.0011036	0.0148972	-3.998618	0.0442227	0.1257943
	(1.02)	(-1.83)	(-0.02)	(0.04)	(-0.36)	(0.49)	(0.31)
Management structure	-0.0593993	---	0.0843366	---	---	0.0355333	---
	(-0.44)	---	(1.49)	---	---	(0.49)	---
Market return	0.3030698	-19.55504	-3.679327	41.14374	9.298397	-3.815052	30.79009
	(0.05)	(-0.67)	(-1.16)	(3.87)***	(0.26)	(-0.93)	(11.07)***
Short-term interest rate	-0.2673869	0.3000321	0.2949602	0.7664212	3.149544	0.3162697	0.1176755
	(-0.71)	(0.77)	(-2.13)**	(1.70)*	(1.33)	(2.00)*	(0.29)
Long-term interest rate	0.3003114	-0.3801005	-0.2225566	-2.126981	-2.671056	-0.3993312	-1.705022
	(0.61)	(-0.62)	(1.09)	(-3.19)***	(-0.69)	(-0.46)	(-1.25)
Exchange rates	3.393568	---	0.0387203	7.870265	---	0.8383463	10.64642
	(1.03)	---	(0.01)	(2.15)**	---	(0.29)	(1.00)
Constant term	-0.9256409	6.934301	0.7541444	-0.1962965	32.80676	1.411582	1.744915
	(-1.41)	(2.33)**	(0.85)	(-0.20)	(2.13)**	(0.95)	(0.74)
2008 Crisis dummy	-1.059182	---	---	1.357818	---	---	---
	(-3.91)***	---	---	(2.00)**	---	---	---

*Note: The t-statistics are reported in parentheses. *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.*

5.0 CONCLUSION

Our study had attempted to examine the determinants of AREIT returns since 1990. Using balanced and unbalanced panels categorised by sub-periods corresponding to the major issues surrounding the AREIT sector, we have found that the size effect has had a negative impact of returns, but this effect has been diminishing over time. We also found that although the sign of the coefficients were consistent with literature, our regression results did not reveal significant findings for the impact of leverage, the percentage of institutional ownership and management structure. Overall market risk was found to be significant and positive only since 2003, suggesting that more recently, AREITs behave more like stocks and less like defensive assets. Additionally, the relationship with exchange rate risks has been positive in recent years, due to more AREITs choosing to diversify internationally, particularly in the U.S. property markets.

The empirical evidence on the relationship between market-to-book ratios and AREIT returns depart from standard finance literature. It appears that the market places a premium on AREITs with higher market-to-book ratios. Also in contrast with most of the REIT literature, the Australian experience when it comes to property-type diversification has shifted from a previous preference towards AREITs diversified across property-types to more recently, a preference for more specialised AREITs. Also departing from the literature has been our findings on the impact of international diversification. We found that domestic AREITs provide better returns than their internationally diversified counterparts, and this may be largely due to the fact that the AREITs classified as internationally diversified, primarily focussed on acquiring properties in the U.S.

rather than from a variety of other countries. We suggest that perhaps the difficulties in accessing economies of scale in the management of such off-shore properties have precluded these AREITs from holding a more geographically diversified property portfolio.

The sensitivities of AREIT returns towards short-term and long-term interest rates also warrant further investigation. Our results are similar to another recent Australian study, but inconsistent with much of the existing literature. The relationship between returns and short term interest rates was found to be positive and significant between 1997 – 2002, and the relationship with long-term interest rates was found to be negative and significant from 2003 – 2008. One possible explanation for this, is to continue from the previous suggestion that AREITs are behaving more like stocks and less like bonds in the latter period. However, it may be more beneficial to conduct a deeper investigation to the kind of debt finance used by AREITs, to help explain the cross-sectional differences between AREIT returns and interest rate sensitivities.

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