

Estimating the impact of debt and management structure on A-REITs performance

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Abstract

A-REITs first emerged on the Australian share market in the early 1970s, having grown in size to A\$148bn in 2007 before plummeting to a low of A\$38 billion in February 2009 (74% reduction). These devaluations have been attributed in part to high levels of debt financing over the A-REITs high growth phase (2001 to 2007), at times done using complex ownership structures. Since the GFC, A-REITs have once again thrived under a low interest environment outperforming broader stock and bond markets. Much of the recovery in the A-REIT sector was the result of debt restructuring and changes to management structure with several funds reverting to internal management.

This study explores the sensitivity of A-REITs performance to changes in short and long term interest rates. To do this, the A-REITs funds are separated into four portfolios: ‘low debt’ and ‘high debt’ based on their relative debt to capital ratios, and ‘stapled’ and ‘unit’ based on their management structure as reported on the ASX website. Note that stapled funds are internally managed and unit funds are externally managed. The dataset covers a 21 year period (1995-2016) spanning multiple cycles in Australian capital markets using an asset pricing model. The results show that A-REIT returns were found to have a statistically significant relationship to market returns, inflation, short and long term changes in interest rates and in some cases inversion of the yield curve. All portfolios exhibited a positive relationship to changes in short term interest rates suggesting that REITs may benefit from higher rental yields in periods of economic growth associated with rising short term interest rates. All portfolios exhibited a negative relationship to changes in long term interest rates suggesting that

REITs suffer from higher costs of debt associated with rising long term interest rates. This effect is greater for high debt compared to low debt funds. Furthermore, stapled funds appear to exhibit greater sensitivity to changes in long term interest rates than unit funds.

Keywords: REITs, management structures, interest rates, debt, Capital Asset Pricing, bonds.

Key in the subject of the topic: *Property investment*

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Introduction

The A\$130 billion Australian real estate investment trusts (A-REITs) are popular investment options for both institutional and retail investors seeking regular income and capital growth. A-REITs are professionally managed vehicles that, in return for a fee, specialise in investing in properties and the management of the portfolio on behalf of investors. Since they are publicly traded, REIT share values reflect the functioning and valuation of stock markets and so provide more liquidity than direct investment in privately traded underlying real estate assets (ASX 2017c; Higgins 2007).

Since establishment in 1970s, the A-REITs sector experienced periods of boom and bust cycles. However, the onset of the Global Financial Crisis (GFC) had the most devastating impact on the sector. The total market value of A-REITs fell from a peak of A\$148 billion in 2007 to A\$38 billion in February 2009 (74% reduction). The reductions have been mainly attributed to high levels of debt financing. The gearing

level in the A-REITs sector increased strongly from 1995, from 10% to around 45% at mid-2008. In addition, De Francesco and Hartigan (2009) and Newell and Razali (2009) found that most fund expansion during this A-REITs high growth period was done using complex ownership structures which disguised the liabilities of the parent trust. Unlike some other global REITs markets, A-REITs managers are not guided by maximum capital (debt) requirements or any restriction on purchasing foreign assets, other than those placed by the fund itself.

Since the GFC, A-REITs have once again thrived under a low interest environment outperforming broader stock and bond markets. The market value has recovered strongly to almost pre-GFC levels. Much of the recovery in the A-REIT sector was the result of debt restructuring (see Figure 1) and also attributed to changes to management structure with several funds reverting to internal management (stapled structure). At 31 August 2017, there were 50 A-REITs listed on ASX, with majority (37 funds) traded as stapled security, up 12% compared to 2008 (see Table 1).

Table: Number of Unit and Stapled A-REITs, 2008 & 2017

	Funds	Units	Stapled
2017	50	31%	69%
2008	58	43%	57%

Source: ASX 2017c; BDO 2009.

The growing shift towards internal management structure is supported by recent studies on interval vs external management. Ambrose and Linneman (2001) and Yong and Singh (2013) found that for some funds the choice of external management structure is based on the notion that external management may enjoy scale economies and superior expertise, which alternately benefit the trust. However, external manager are remunerated both on a base fee computed from assets under management and an incentive fee based on achieving performance targets. Therefore, the conscious is that external managers may prioritise growing the firm's asset base rather than optimising profitability, high return investments. In contrast, an internal management structure would not suffer from this problem. This research investigates A-REITs performance to changes in short and long term interest rates based on their management structure: 'stapled' and 'unit' funds. In Australia, studies on the performance of REITs relative to changes in the interest rates are limited. Given the volatility of A-REIT performance and the sector's historical reliance on debt, fund managers and other market investors/participants would benefit from further investigation. This study is both relevant and timely given expected future upward shifts in interest rate policy in Australia.

Literature on the impact of interest rates on REIT performance under different management structures is discussed in the next section. Section three provides an explanation of data and methodology. Section four examines the empirical research findings and discussions. Section five provides the conclusion.

Literature Review

The A-REITs sector was based originally on passive investment strategies, involving quality property/lease-backed income streams. Initially, A-REITs almost exclusively owned properties only. However, from the late 1990s, some trusts have diversified into other activities, such as funds management and property development, which has given rise to 'stapled REITs'. As such, A-REITs management structure is now defined as 'stapled' and 'units'. Stapled funds are internally managed and unit funds are externally managed.

In the classic A-REIT structure, the property is held on trust for investors by a trustee and the business of managing the fund is carried on by a separate manager. More recently the roles of the trustees and the manager have been combined into a single responsible entity (RE). With the classic structure, the role of trustee involved only holding assets for unit holders and the distribution of fund net income. The manager made all the day-to-day operational decisions. With the new structure, the RE performs both roles. The stapled structure effectively changes the REIT to an internal management structure as the shares in the management company and units in the REIT are both listed and traded on the ASX as a single security. Under stapled securities structure, the trust holds the long-term property investments, while the related company carries on the fund's management functions, any trading or business activities including management of any development activities. As such the shares and units are not separable and they must be bought and sold together. Under external management structure (unit funds), the manager is a completely separate entity. External managers would charge fees for other services carried out by the manager (Higgins 2007; Rowland 2010).

The review of literature highlights the benefits and issues with both internal and external management structures. Striewe, Rottke and Zietz (2013) explain that external managers are expected to pursue personal goals, example maximisation of their compensation and personal assets. The external manager's personal goals may not align with REIT shareholder's wealth maximisation objectives, creating agency conflict issues. In addition, external fund managers also charge advisor fees for property acquisition, increasing the incentive for excessive expansion even further. However, Benfield and Pyles (2009) argue there are benefits of considering external managers, mainly for small sized funds given their staff limitations. Their findings suggest that any additional costs of employing a third party advisor are offset by the potential benefits for these smaller funds. In addition, formal unitholders approval for major transactions between manager and trust is required, whilst majority of unitholders can vote a manager out. Although the stapled structure does address the issues of alignment of interest between manager and investor, it does represent greater risks as some stapled funds do take on additional property development and fund management activities.

Several studies (Cannon and Vogt 1995; Capozza and Seguin 2000; Keng 2004) identified statistical significant evidence that the internal self-managed REITs outperform externally managed REITs on a risk-adjusted basis. To the extent that managerial compensation is based on performance, managerial self-interest may lead to strategies that incur more risk in an effort to enhance returns. Also, to the extent that self-managers are stakeholders, internal REIT managers are motivated to make decisions favourable to the REIT, whether through return enhancement or risk reduction

(Allen *et al.* 2000; Ratcliffe and Dimovski 2007). Further Zarebski and Dimovski (2012) found that unique tax rule applicable to A-REITs provides large disincentive to retain earnings thus favouring the stapled structure. In another perspective, the greater the ratio of general and administrative expenses to net income, the more likely that agency cost is a problem and the higher the beta for the firm which is a positively relationship (Delcours and Dickens 2004). Chong, Ting and Cheng (2017) in their study of Asian REITs identified that agency costs such as asset turnover and operating expense ratio persist overtime affecting performance negatively and discounting the value of REITs in Asia. Asian REITs predominately operate under external management structure.

Striewe, Rottke and Zietz (2013) further explain that such agency conflicts can be identified by investigating how the capital structure varies in conjunction with the adviser structure. Their study highlighted that externally managed REITs are likely to choose higher leverage structures than internally managed funds. The excessive leverage for externally managed funds may be attributed to misaligned remuneration structure of external manager that neglects interest expenses. Internally advised REIT's managers are compensated based on fund's net income. So they are more likely to factor-in interest expenses in their decision making. In contrast, external fund managers are usually compensated based on the value of assets under management and thus tempted to raise leveraged more than is consistent with shareholder wealth maximisation as the impact of interest expenses are not part of their remuneration outcomes.

Capozza and Seguin (2000) study in United States found that for externally managed trusts, debt contracts are negotiated at excessive rates, stating that when externally managed funds borrow money and invest the proceeds in real assets, they borrow at rates that exceed the current yield they receive from the property. Chikolwa (2011) study on A-REITs found that stapled management structure have a significant negative impact on leverage, identifying that A-REITs with internal management should have lower gearing levels. Chikolwa (2011) further explained that this result is confusing, as internal A-REITs are expected to performed strongly during boom market conditions.

In Australia, studies on the performance of REITs relative to changes in the interest rates are limited. A study by Ratcliffe and Dimowski (2007) noted that A-REITs have a significant negative relationship with long term interest rates but an insignificant positive relationship with short term movements in interest rates. Yong and Singh (2015) found that the negative impact of interest rate risk only affects A-REITs during stable and expanding market conditions. Given the volatility of A-REIT performance and the sector's historical reliance on debt driven capital, investors and other market participants would benefit from further investigation into the nature of A-REIT returns and their relationship to interest rates.

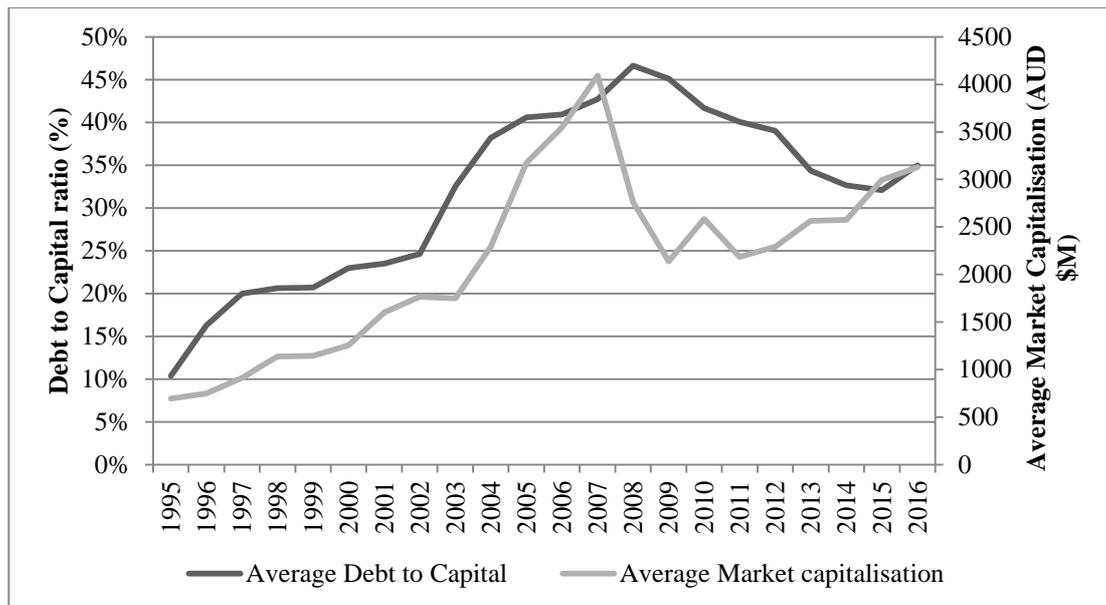
Data and Methodology

Data

This research aims to quantify the relationship over time between interest rates and A-REITs over 21 year timeframe (1995-2016) using ex-post monthly total return asset benchmark data and macroeconomic data. In particular, the A-REITs funds are separated into four portfolios: 'low debt' and 'high debt' based on their relative debt to capital ratios, and 'stapled' and 'unit' based on their management structure.

All financial variables including: adjusted closing prices (2), number of shares outstanding, debt to capital ratios (3), capitalisation and market price indices were obtained from relevant benchmark sources: Australian Equities - ASX All Ordinaries Accumulation; Listed Property (A-REITs) - S&P/ASX 200 A-REIT Index; Australian Fixed Income - CBA Bond: 10 year treasury bond; and, macroeconomic data: Gross Domestic Product (GDP), Inflation rates sourced from the Reserve Bank of Australia (RBA). The 90-day bank bill and 10-year government bond yield rates are used as short-term and long-term interest rate proxies respectively. Figure 1 outlines the historical gearing and the market capitalisation for A-REITs sector.

Figure 1: A-REITs Historical Gearing Level and Market Capitalisation: 1995-2016

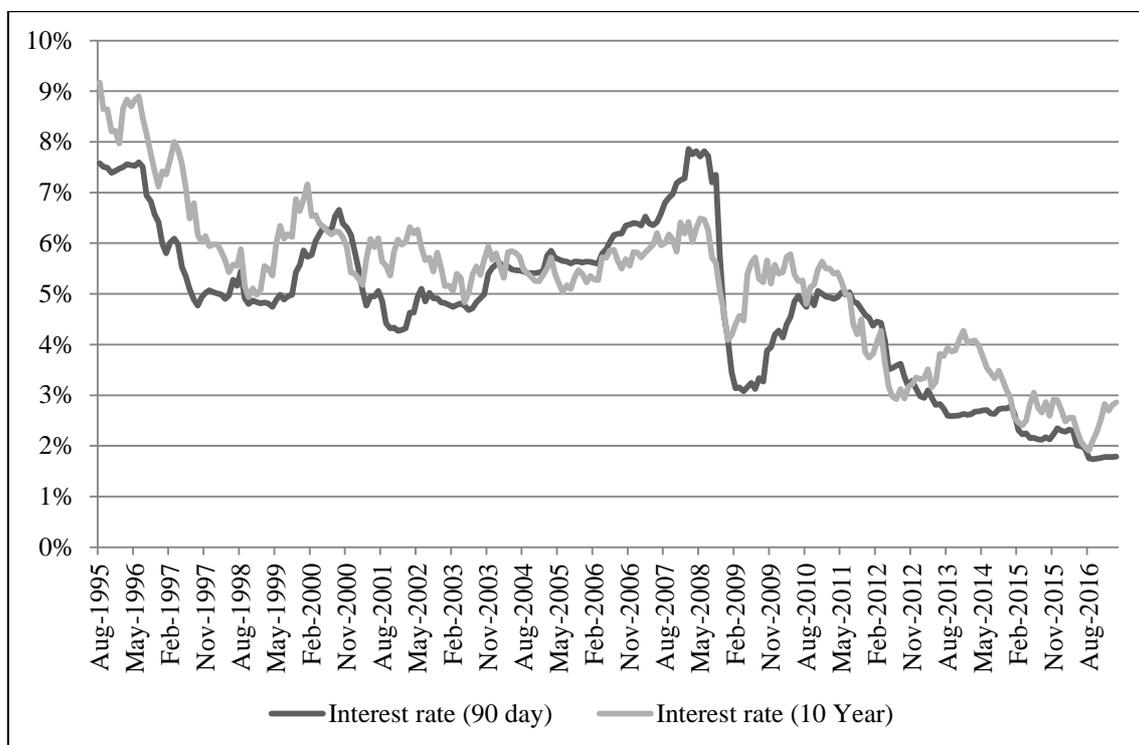


Source: ASX (2017a)

Figure 1 shows that the gearing level in the A-REITs sector increased strongly from 1995, from 10% to around 45% at mid-2008. There is also a strong correlation to market capitalisation over this period as the additional capital was used to expand the range of operating activities. Eventually the collapse of stock prices, including A-REITs, widening credit spreads, and the freeze-up of the private equity real estate market in late 2007, resulted in a significant decline in returns and values. Funds with higher debt levels were significantly affected during the GFC, leading to the collapse and re-capitalisation of several leading A-REITs. As a result, the sector average gearing level has dropped to around 30% in June 2016.

A-REITs current market capitalisation is similar to pre-GFC levels, with the sector's strong recovery also tied to the low interest environment. For much of the past decade, Australia has operated in a low interest environment. Australia's interest rates have transitioned from a high of approximately 7% in the mid-1990s to historic lows of 1.5% in recent times. Figure 2 shows that both the 90 day and 10 year interest rates are at historical lows, providing an advantageous investment environment for A-REITs. Low interest rates mean that A-REITs improve their cost of borrowing and also increase demand for, and therefore the valuation of, their properties. However, cheap debt provides added incentive for A-REITs to take on more risky investments. Any increase in short or long-term interest rates could have significant implications on the fund's debt serviceability, which is especially true for A-REITs that are highly leveraged.

Figure 2: Australian Short and Long Term Interest Movements: 1995-2016

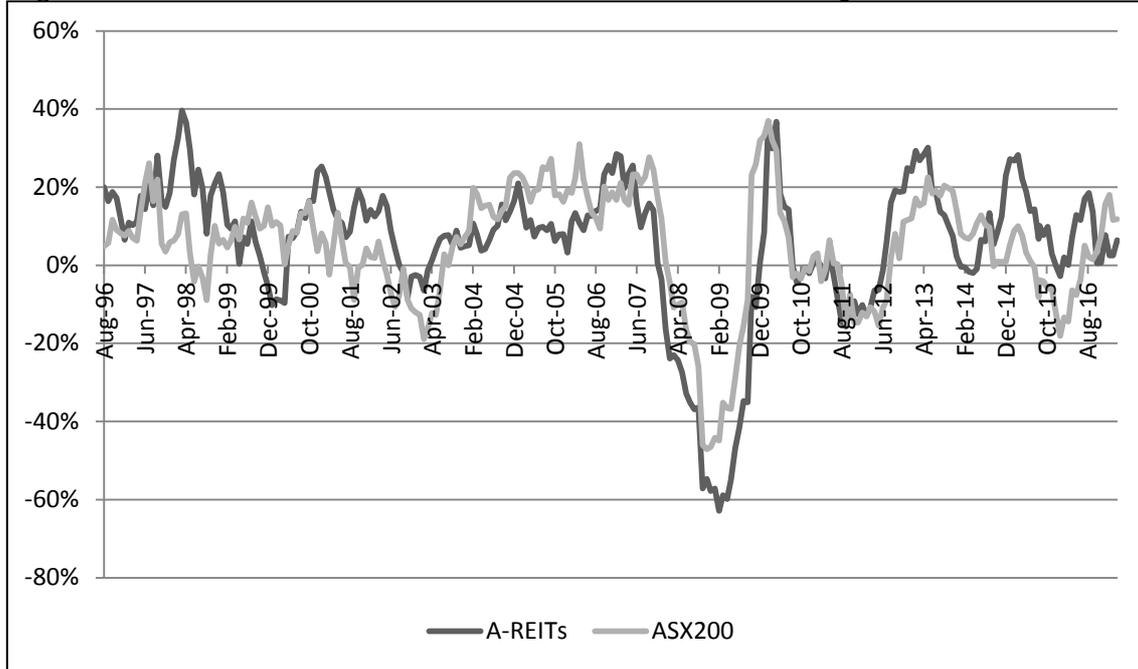


Source: RBA (2017)

Figure 3 outline the historical returns for A-REITs and Australian Equities.

Figure 3 demonstrates that A-REITs experienced distinct phases of the economic cycle characterised by boom period (prior to September 2007), recession (September 2007 – August 2009) and recovery (August 2009 onwards). The years prior to the GFC were characterised by strong economic growth and relative prosperity. This was punctuated by several spikes in inflation and overall high interest rates. In contrast, the onset of the GFC saw falling economic growth, rising volatility in inflation and sharp reductions in interest rates. This led to significant falls in both A-REITs and Australian equities performance. As the economy entered its post GFC recovery phase, there was a partial restoration of GDP growth and further reductions in interest rates, which translated into recovery for both A-REITs and Australian Equities.

Figure 3: Annualised Historical Returns for A-REITs and Equities: 1995 – 2016



Source: ASX (2017a, b)

Methodology

This research follows the Chen and Tzang (1998) and (Merton 1987) approach to show the sensitivity of REITs to short-term and long-term interest rates by using the capital asset pricing model. Merton's (1973) intertemporal capital asset pricing model (ICAPM) proposed that investors receive a premium for bearing market (systematic) risk as well as additional risk in the form of unfavourable shifts in the investment opportunity set, represented by a series of state variable(s). The ICAPM therefore has the following specification:

$$E(R_t) - \alpha = \beta_1[E(R_{mt}) - \alpha] + \beta_2[E(R_{ht}) - \alpha] \quad (1)$$

where

$E(R_t)$ = expected return on an asset in period t

$E(R_{mt})$ = expected return on the market portfolio in period t

$E(R_{ht})$ = expected return on a hedge portfolio constructed to have a covariance with each asset's return that is identical to the covariance between the changes in the state variable of interest and the asset's return

α = the risk free rate

To test the ICAPM, Gibbons (1980; 1982) suggested the following market model with the addition of a changing state variable:

$$R_t = \beta_0 + \beta_1 R_{mt} + \beta_2 \Delta S_t + \varepsilon_t \quad (2)$$

where ΔS_t = changes in the state variable, S in period t

The choice of an appropriate state variable therefore is an important empirical issue. Merton (1973) suggested the use of long term interest rates, stating (p. 873):

The interest rate has always been an important variable in portfolio theory, general capital theory, and to practitioners. It is observable, satisfies the condition of being stochastic over time, and while it is surely not the sole determinant of yields on other assets, it is an important factor. Hence, one should interpret the effects of a changing interest rate ... as a single (instrumental) variable representation of shifts in the investment opportunity set.

Based on Merton's suggestion, we propose the following:

$$E(R_t) = \beta_0 + \beta_1 STOCK + \beta_2 BILL + \beta_3 BOND + X_t' \beta \quad (3)$$

The variable *STOCK* is computed as the monthly logarithmic returns for the ASX200 stock market index. *BILL* and *BOND* represent the changes in yields of 90-day bank accepted bills and 10 year treasury bonds respectively. Lastly, X_t is a vector of macroeconomic indicators including inflation and GDP growth rates. To accommodate the possibility of leading and lagging effects, leads and lags of up to 2 periods in the explanatory variables were tested in the preceding equation.

Results and Discussion

Descriptive statistics for all variables in annualised form are produced in Table 2.

Table 2: Descriptive Statistics (annualised rates): August 1996 – August 2016

	A-REITs	STOCK	BILL	BOND	Inflation	%ΔGDP
Mean	4.19%	4.81%	4.91%	5.43%	2.62%	3.28%
Median	10.86%	6.72%	4.95%	5.50%	2.63%	3.63%
Std Dev.	24.39%	14.86%	1.63%	1.75%	1.13%	0.91%
Min	-82.81%	-47.13%	1.74%	1.91%	0.23%	1.82%
Max	74.72%	36.89%	8.27%	10.55%	4.45%	5.01%
Skew	-1.7231	-0.9866	-0.0015	0.0045	-0.1413	-0.1119
Kurtosis	3.8728	1.6917	-0.0065	0.0058	0.0953	-0.9880

Source: Author

These statistics indicate that over the sample period, A-REITs performance was marginally lower than general equities with mean returns of 4.19% vs. 4.81%. However, when median returns are considered, the A-REIT sector outperformed general equities (10.86% vs. 6.72%) with higher levels of risk as indicated by the standard deviation (24.39% vs. 14.86%).

To examine the effect of leverage, A-REITs were allocated into four different portfolios: high debt (HD), low debt (LD), stapled and unit REITs. HD and LD funds

were separated based on gearing levels. A fund was considered LD if its debt to capital ratio was lower than the cross sectional average in the prevailing period and HD otherwise. Note that stapled funds are internally managed and unit funds are externally managed. Average portfolio returns were used in cross sectional asset pricing tests via equation 3.

In total, there were 55 A-REIT entities available for analysis. To be included in the sample, REITs must satisfy size and data availability requirements. Funds with less than 24 months of available data were removed from the sample. Also, funds with less than A\$100m in market capitalisation were not considered. Lastly, the Scentre fund was recombined with Westfield; and Centro fund was recombined with Federation (now known as Vicinity). The recombined returns were calculated as a value weighted averages using market capitalisation as weights. In total, 25 funds were removed/incorporated via these filters. Table 3 provides details of the sample funds.

Table 3: Selected A-REITs fund profiles

	Funds	Market Capitalisation (\$m)	Market Coverage (by value)
Stapled	20	87,777.88	93%
Units	10	6,655.81	7%
Total	30	94,433.69	

Source: ASX (2017a, b)

The sample included 20 stapled and 10 unit REITs with market value of approximately A\$94 billion. Stapled funds dominate by size and market capitalisation value, accounting for 93% of market coverage. It appears smaller funds, with limited capital are more likely to use an external management structure. This is consistent with findings from Benfield and Pyles (2009) that found that any additional costs of employing a third party advisor are offset by the potential benefits for these smaller funds.

Table 4 provides the descriptive statistics for all portfolios. The columns ALL, LD and HD were based on monthly return data for A-REITs and represent a portfolio containing ALL funds, Low and High Debt funds respectively. Similarly the columns, Stapled and Units are representation of internally and externally managed funds respectively. For ease of interpretation, monthly returns data were annualised.

Table 4: Descriptive Statistics Annualised Asset Return: 1995 to 2016.

	ALL	LD	HD	Stapled	Units
Mean	4.19%	1.28%	3.86%	4.24%	2.05%
Median	10.86%	6.55%	9.29%	10.18%	7.21%
Std. Dev	24.39%	23.77%	24.63%	25.73%	26.08%
Min	-82.81%	-79.91%	-85.79%	-84.00%	-99.00%
Max	74.72%	78.78%	58.09%	77.73%	64.69%
Skew	-1.7231	-1.1846	-1.9289	-1.53003	-1.9432
Kurtosis	3.8728	2.3384	4.3007	3.2668	4.5886
DCR*	32.43%	21.33%	45.23%	29.92%	36.15%

Note: *Average Debt to Capital Ratio (Gearing)

Table for analysis shows that HD funds generated higher returns than LD funds (4% vs. 1%) but also exhibited slightly higher risk. As defined, HD funds were more highly leveraged than LD funds as indicated by the average debt to capital ratios (45% vs. 21%). This is expected given these funds borrowed aggressively to fund expansion in the years prior to the financial crisis of 2007-2009. Stapled funds generated higher returns than Unit funds (4% vs. 2%) with slightly lower risk. In addition, Stapled funds recorded lower gearing compared to Unit funds (30% v 36%).

The results from the cross sectional asset pricing tests are summarised in Table 5.

Table 5: Summary of Regression Analysis, Impact of Debt and Management Structure: 1995 to 2016

	ALL Funds	LD	HD	Stapled	Unit
Constant	0.016**	0.015**	0.017**	0.015**	0.017**
ASX 200 Returns	0.785***	0.899***	0.729***	0.820***	0.687***
Inflation	-0.005*	-0.006**	-0.006**	-0.005*	-0.005**
Interest rate (90 day)	5.377***	5.633***	7.386***	5.416***	5.594***
Interest rate (10 year)	-0.608	-3.243**	-3.480***	-0.547	-2.372*
Yield Curve Inversion	-0.011	-0.010	-0.009	-0.011	-0.012*
Adjusted R ²	0.375	0.414	0.404	0.368	0.378

*, ** and *** denote statistically significant coefficients at the 10%, 5% and 1% levels respectively

As with prior analysis, returns were found to have a statistically significant relationship to market returns, inflation, short and long term changes in interest rates and in some cases inversion of the yield curve. All portfolios exhibited a positive relationship to changes in short term interest rates suggesting that A-REITs may benefit from higher rental yields in periods of economic growth associated with rising short term interest rates.

All portfolios exhibited a negative relationship to changes in long term interest rates suggesting that A-REITs suffer from higher costs of debt associated with rising long term interest rates. This effect is greater for HD funds compared to LD funds. Furthermore, Stapled funds appear to exhibit greater sensitivity to changes in long term interest rates than Unit funds. All portfolios exhibited a negative relationship to inflation suggesting that higher inflation reduces returns. All portfolios also exhibited a strong relationship with market returns. This is consistent with general portfolio theory.

Conclusion

The A-REITs sector had experienced distinct phases of boom and bust economic cycles. The years prior to the GFC were characterised by strong economic growth and relative prosperity. This was punctuated by several spikes in inflation and overall high interest rates. In contrast, the onset of the GFC saw falling economic growth, rising volatility in inflation and sharp reductions in interest rates. This study examined the sensitivity of A-REITs performance to changes in short and long term interest rates over 21 year period (1995-2016). To do this, the A-REITs funds are separated into four portfolios: 'low debt' and 'high debt' based on their relative debt to capital ratios, and 'stapled' and 'unit' based on their management structure as reported on the ASX website.

Stapled funds are internally managed and unit funds are externally managed. A review of recent literature and current market status highlight that there is growing shift towards internal management structure. The conscious is that external managers may prioritise growing the firm's asset base rather than optimising profitability, high return investments. In contrast, an internal management structure would not suffer from this problem. Stapled funds dominate A-REIT landscape by size and market capitalisation value, accounting for 93% of market coverage. External management structure appears to be only popular with smaller funds with low market values due to resource limitations.

The empirical results show that A-REITs performance was marginally lower than general equities with mean returns of 4.19% vs. 4.81%. A-REITs sector also exhibited higher levels of risk (24.39% vs. 14.86%). HD funds generated higher returns than LD funds (4% vs. 1%) but also exhibited slightly higher risk. As expected, HD funds were more highly leveraged than LD funds (45% vs. 21% gearing level). The Stapled funds generated higher returns than Unit funds (4% vs. 2%) with slightly lower risk. In addition, Stapled funds recorded lower gearing levels compared to Unit funds (30% v 36%). All portfolios exhibited a positive relationship to changes in short term interest rates suggesting that REITs may benefit from higher rental yields in periods of economic growth associated with rising short term interest rates. All portfolios exhibited a negative relationship to changes in long term interest rates suggesting that REITs suffer from higher costs of debt associated with rising long term interest rates. This effect in changes in long term interest rate is greater for HD funds compared to LD funds. Stapled funds appear to exhibit greater sensitivity to changes in long term interest rates than Unit funds. The implications for asset allocation strategies is that portfolio managers and other investors can reduce exposure to interest rate risk by selecting funds with less debt and with stapled (internal management) structure.

References

- Allen, M.T., Madura, J., & Springer, T.M. (2000). REIT characteristics and the sensitivity of REIT returns. *The Journal of Real Estate Finance and Economics*, 21(2), 141-152.
- Ambrose, B., & Linneman, P. (2001). REIT organizational structure and operating characteristics. *Journal of Real Estate Research*, 21(3), 141-162.
- ASX (2017a). SandP/ASX All Ordinaries Accumulation Index. Sydney: Australian Securities Exchange. Retrieved July 22, 2017, from <<http://au.spindices.com/indices/equity/all-ordinaries>>.
- ASX (2017b). SandP/ASX 200 A-REIT Index. Sydney: Australian Stock Exchange. Retrieved July 17, 2017, from <<http://au.spindices.com/indices/equity/sp-asx-200-a-reit-sector>>.
- ASX (2017c). Managed funds. Sydney: Australian Securities Exchange. Retrieved October 8, 2017, from <<http://www.asx.com.au/products/managed-funds.htm>>.
- BDO (2009). BDO A-REIT Survey 2009, BDO Securities, NSW.
- Benfield, J.D. & Pyles, M.K.(2009). Internally versus externally advised non-brokerage real estate firms. *The Journal of Alternative Investments*, 12(1), pp.39-49.

- Cannon, S. & Vogt, S. (1995). REITs and their management: an analysis of organizational structure, performance and management compensation. *Journal of Real Estate Research*, 10(3), pp.297-317.
- Capozza, D. R. & Seguin, P. J. 2000. Debt, agency, and management contracts in REITs: the external advisor puzzle. *The Journal of Real Estate Finance and Economics*, 20, 91-116.
- Chen, K., & Tzang, D. (1988). Interest-rate sensitivity of real estate investment trusts. *Journal of Real Estate Research*, 3(3), 13-22.
- Chikolwa, B. (2011). Investigating the Capital Structure of A-REITs. *Journal of Real Estate Literature*, 19(2), 391-412.
- Chong, W.L., Ting, K.H. & Cheng, F.F. (2017). The performance of externally managed REITs in Asia: Further evidence from free cash flow and agency costs. *Journal of Property Investment & Finance*, 35(2), pp.200-227.
- De Francesco, A., & Hartigan, L.R. (2009). The impact of changing risk characteristics in the A-REIT sector. *Journal of Property Investment and Finance*, 27(6), 543-562.
- Delcours, N. & Dickens, R. (2004). REIT and REOC systematic risk sensitivity. *Journal of Real Estate Research*, vol. 26, pp. 237-254.
- Gibbons, M.R. (1982). Multivariate tests of financial models: A new approach. *Journal of Financial Economics*, 10 (1), 3-27.
- Gibbons, M.R. (1980). *Econometric methods for testing a class of financial models: An application of the Nonlinear Multivariate Regression Model*. University of Chicago, ProQuest Dissertations Publishing.
- Higgins, D. (2007). Placing commercial property in the Australian capital markets. *RICS Research Paper Series*, 7(12), London.
- Keng, T.Y. (2004). The effects of management structure on the performance of listed property trusts, Proceeding of *11th European Real Estate Society Conference*. ERES: Conference. Milano, Italy, 2004.
- Merton, R.C. (1987). A simple model of Capital Market Equilibrium with incomplete information. *The Journal of Finance*, 42(3), 483-510.
- Merton, R.C. (1973). An intertemporal capital asset pricing model. *Econometrica*, 41(5), 867-887.
- Newell, G & Razali, MN 2009, 'The impact of the Global Financial Crisis on commercial property investment in Asia', *Pacific Rim Property Research Journal*, vol. 15, no. 4, pp. 430-452.
- RBA (2017). *Chart pack – Interest rates*. Sydney: Reserve Bank of Australia. Retrieved May 01, 2017, from <<http://www.rba.gov.au/chart-pack/interest-rates.html>>.
- Ratcliffe, C., & Dimovski, W. (2007). The responsiveness of LPT returns and their attributes. *Pacific Rim Property Research Journal*, 13 (3), 280-297.
- Rowland, P.J. (2010). *Australian property investments and financing*. Sydney: Thomson Reuters (Professional Australia) Limited.
- Striwe, N., Rottke, N. & Zietz, J. (2013). The impact of institutional ownership on REIT performance. *Journal of Real Estate Portfolio Management*, 19(1), pp.17-30.
- Yong, J., & Singh, A. (2014). *Interest rate risk of Australian REITs: a panel analysis*. Paper presented in 20th Pacific Rim Real Estate Society Conference. PRRES Conference. Christchurch, New Zealand.
- Zarebski, P. and Dimovski, B. (2012), 'Determinants of capital structure of A-REITs and the global financial crisis, *Pacific Rim Property Research Journal*, Vol. 18, No. 1, pp. 3-19.