Determinants of Capital Structure for A-REITs

Bwembya Chikolwa[♣]
School of Urban Development, Queensland University of Technology
GPO Box 2434, Brisbane Qld 4001, Australia

[♣] Tel.: +61 7 3138 4072; fax: +61 7 3864 1170
Email address: bwembya.chikolwa@qut.edu.au

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Abstract

Using panel data methodology, the determinants of capital structure in 34 Australia listed property trusts (A-REITs) are investigated for the period 2003-2008. Empirical results reveal that profitability, growth opportunity, and operational risk are negatively related to leverage while size is positively related. Tangibility is found to be insignificant and property sector effects are inconsistent in various models. Furthermore, industry specific factors of stapled management structure and international operations have significant negative signs, showing that A-REITs with these features should have lower gearing levels. The signs of the determinants show that both pecking order theory and the trade-off theory are at work in explaining the capital structure of A-REITs, although more evidence exists to validate the latter theory. The study also shows that A-REITs issued more public debt than seasoned equity issues at a ratio of 1:1.2 from 2000-2008.

Keywords:

Capital structure, A-REITs, trade-off theory, pecking order

1. Introduction

One of the research challenges faced by financial economists has been the determinants of capital structure following Modigliani and Miller's (MM) (Modigliani & Miller 1958, 1963) proposition that the capital structure is *irrelevant* to the value of a company. In addition, Myer's (1984) *capital structure puzzle* has fuelled great debate on which of the two follow-on theories after MM, *trade-off* and *pecking order*, is the most relevant in determining capital structure.

Property companies, in particular real estate investment trusts (REITs), offer some unique characteristics on which to test the theories of capital structure. REITs have a great deal of collateral which can be used to support high levels of debt and distribute nearly all of their profits as dividends.

A-REITs are a major property investment and financing vehicle in Australia, with an outstanding track-record and significant commercial property assets, being available to both general and

institutional investors. As at December 2007, A-REITs had assets worth AU$206 billion, representing about 50% of the commercial property investment market and 55% of the securitised property investment market (De Francesco 2008; PIR 2008a). This sees the A-REITs market as the second largest globally after the US (Newell 2008).

To the best of knowledge, this is the first study to examine the capital structure determinants of A-REITs. As such, the purpose of this paper is to analyse the determinants of the capital structure of A-REITs by examining the relationship between leverage and a set of explanatory variables. Furthermore, the study differs from previous studies as it includes other firm-specific attributes such as property sector, stapled management structure and international operations in addition to the traditional determinants of capital structure such as asset size, profitability ratios, tangibility of assets, growth opportunities, and operating risk. The analysis is conducted using an unbalanced panel data pertaining to 34 A-REITs for the period 2003-2008. A total of 199 observations are available for analysis.

Our results show that profitability, growth opportunity, and operational risk are negatively related to leverage while size is positively related. Tangibility is found to be insignificant and property sector effects are inconsistent in various models. Furthermore, industry specific factors of stapled management structure and international operations have significant negative signs, showing that A-REITs with these features should have lower gearing levels. The signs of the determinants show that both pecking order theory and the trade-off theory are at work in explaining the capital structure of A-REITs, although more evidence exists to validate the latter theory. The study also shows that A-REITs issued more public debt than seasoned equity issues at a ratio of 1:1.2 from 2000-2008.

The paper is structured as follows. Section 2 tracks the financing activities of A-REITs over the study period. Next, Section 3 reviews literature on capital structure. Section 4 discusses the data and methodology. The study results and their analyses are shown in Section 5. Concluding remarks and future research directions are shown in Section 6.

2. Financing Activities of A-REITs

Many A-REITs used equity capital to fuel growth and expansion during the mid-1990's, but later switched to debt financing in 1997 when the RBA cut interest rates in the second half of 1996, which made debt financing a cheaper option to equity capital (Kavanagh 1997). PIR (2008b)

state that a total AU$52 billion has been raised through equity raisings between 1999 – October 2008. Of the funds raised during this period, 43% was used to acquire new property. On average equity raisings by A-REITs show an upward trend as shown in Figure 1. A drastic reduction is noted for the year 2008 as a result of turbulent events in the share market.

Insert Figure 1

Debt funding has played a significant role in A-REIT growth, increasing from 10% in 1995 to 35% in 2007 (Newell 2008). As at December 2007, the A-REIT sector had total assets worth AU$ 206 billion, comprising more than 3000 institutional-grade properties in diversified and sector-specific portfolios (PIR 2008a). In structuring this debt profile, A-REITs have used a range of sophisticated debt products including CMBS, property trust bonds and off-balance sheet financing (Chikolwa 2008a). Table 1 shows details of CMBS and bond raisings by A-REITs from 2000-2008.

Insert Table 1

A total of over AU$26 billion has been raised by A-REITs using these two debt funding instruments. From Q3/2007, no CMBSs or bonds have been issued by A-REITs in Australia as a direct result of the credit squeeze. Chikolwa (2008b) show that at current predicted spreads of 150-200 basis points (bp), issuance of AAA-rated CMBS tranches would be uneconomical. Furthermore, PA magazine (2008) show the BBB+-rated bond issue by Dexus of AU$200 million in February 2007 was priced at 483bp over the 3 month bank bill swap rate (BBSW), signifying a drastic change in market conditions from February 2004 when similar rated notes were priced at between 35-40 bp.

Private bank debt has also been used to fund A-REIT expansion and operations. However, limited disclosure restricts information in the private debt market. Higgins (2007) estimated the value of outstanding Australian whole commercial property mortgages in 2007 to be AU$71 billion. He further went on to estimate the Australian property investment market estimated at AU$232 billion[1], of which 72% was held by institutional investors. With 55% of institutional

[1] De Francisco (2008) has since reviewed the value of the Australian commercial property at AU$300, with A-REITs representing about 50% of the market.

owned property held by A-REITs, it can be inferred that a sizeable share of private bank lending goes to A-REITs.

The initial response by A-REIT to the credit squeeze was to cut dividends and to lower gearing through asset sales. It was estimated that between AU$15-20 billion worth of commercial property was sale on the market at June 2008 (Standard & Poor's 2008). With empirical evidence of asset sales leading to the depressing of the share price, most A-REITs resorted to off-market transactions in selling their properties. The glut of commercial properties on the market and debt funding difficulties resulted in a rise in commercial property yields after several years of contraction. For instance, premium and 'A' grade office yields increased by approximately 100 bp to December 2008 (DTZ Research 2008). According to CB Richard Ellis, sales of commercial property fell 60% to AU$3 billion in the first 6 months of 2008 (Condon 2008). Discount rates (across both core and non-core sectors) are set to soften over the short-term (next 12-18 months) to sit between 8.5%-11.5%, depending on sector and asset quality (De Francesco & Bonello 2008).

A recent development in funding strategies by some A-REITs has been to increase equity, either by introducing a dividend reinvestment plan or seeking additional capital. Nearly AU$22 billion was raised from 1999-March 2008 from seasoned equity issues as shown in Table 2. A breakdown of these seasoned equity issues covering the period 1999-March 2008 is shown in Figure 2.

Insert Table 2

Insert Figure 2

Table 3 shows some of the equity raisings by A-REITs in October 2008. GPT Group and Goodman Group raised more than AU$2.3 billion, with Goodman raising AU$755 million at 90 cents in a unit. Buyers of these equities included some sovereign wealth funds. For example GIC of Singapore increased its stake in Mirvac and GPT Group to 6% and 10%, respectively. A negative share price reaction has been noted after seasoned equity issues (Brealey et al. 2008; Brounen & Eichholtz 2002a; Marciukaityte et al. 2007). As such, these equity capital raising strategies will lead to a dilution of A-REIT base earnings.

Insert Table 3

The review of the A-REIT financing activity is important in investigating their capital structure, in particular the determinants of debt funding or leverage following similar empirical studies in other parts of the world.

3. Literature Review

Studies on capital structure have evolved from the seminar papers by Modigliani and Miller (1958; 1963), who argued that in a world of frictionless capital markets optimal financial structure is irrelevant. Subsequently, with consideration of costs of debt due to information asymmetry, the tax benefits of debt financing and the conflict of interest between managers, shareholders and creditors, two theories of capital structure have emerged: the *trade-off theory* and the *pecking order hypothesis*.

The trade-off theory posits that firms observe a target debt ratio that is defined by a trade-off between tax deductibility of interest and costs of financial distress. It is observed that tax deductibility of interest payments induces firms to borrow to a point where the present value of interest tax shield is just offset by the value of loss due to the possibility of financial distress. Since profitable firms have higher income shield, and greater free cash flow, theory predicts higher leverage for profitable firms, and the opposite for firms with investment opportunities perceived to be risky. Indirect costs substantially influence capital financing with Anderson and Betker (1995) and Castanias (1983) finding a significant negative relationship between bankruptcy costs and leverage. High (low)-growth firms that are more sensitive to business fluctuations in business outlook and are therefore more vulnerable to financial distress, choose lower (higher) leverage ratio (Barclay et al. 2006).

The pecking order hypothesis by Myers (1984) and Myers and Majluf (1984) is driven by asymmetric information and signalling problems associated with external financing. The hypothesis predicts that firm's rank financing choices by their sensitivity to asymmetric information, choosing to use internal rather than external financing, and preferring debt to equity. This hierarchical behaviour is aimed at minimising the cost of information asymmetry. Literature is contradictory on the correctness of the theory; Shyam-Sunder and Myers (1999)

state that firms facing a financial deficit resort to debt, and then if it needs are great enough, to sources of financing lower and lower down the pecking order of financial choice. Chriniko and Singha (2000) and Frank and Goyal (2003) doubt the correctness of the theory because firms can never issue equities if they can issue investment-grade debt. However, the pecking order hypothesis explains some of the observations not explained by the static trade-off theory. The strong negative relationship between profitability and leverage is explainable (Gaud et al. 2005; Ghosh et al. 1997; Rajan & Zingales 1995).

Baker and Wurgler (2002) advocate the *market timing theory on* the basis that an optimal capital structure does not exist and that a firm's observed capital structure is nothing more than a cumulative outcome of its past attempts to time the market. Recent real estate studies supporting this theory are Ooi (2008; 2007). This theory is outside the realms of this study and is therefore not discussed further.

Real estate companies have special features that make them an interesting case study for capital structure choice. For instance, REITs are not required to pay taxes if they distribute 90% of taxable income as dividends. As such, the two important benefits of debt are nullified, i.e., tax deductibility of interest is lost and with most income distributed, debt servicing is not critical in mitigating agency cost of free cash flow. Debt in REIT financing at IPO accounts for more than 50% and increases to over 65% in 10 years (Feng et al. 2007).

There has been an increase in capital structure studies in real estate in past two years, with most studies being US-based (Feng et al. 2007; Giambona et al. 2008; Morri & Beretta 2008; Ooi et al. 2008; Ooi et al. 2007), following earlier work by Howe and Shilling (1988), Maris and Elayan (1990), Gau and Wang (1990), Jaffe (1991), Allen (1992), Cannaday and Yang (1996), Brown and Riddiough (2003), and Han (2004). Similar studies for other countries and regions are: Europe: (Brounen & Eichholtz 2002b), UK: Westgaard (2008), Bond and Scott (2006), Ooi (1999), Backham (1997); Sweden: Hammes and Chen (2004).

The general conclusion in most of these studies is that the pecking order theory dominates the trade-off theory in real estate financing activities, although some differences of the influence of determinants are noted. Table 4 shows revealed signs of the determinants of leverage according to different theories of capital structure by previous research on REITs.

Insert Table 4

4. Data and Methodology

4.1 Data

The financial data for A-REITs were collected from Aspect Fin Analysis database for the period 2003-2008. A total of 34 firms are included in the dataset, with a total of 1999 firm-year observations. Some firms did not have a full 6 year set of financial records as they had been listed after 2003. Their exclusion could have resulted in an incomplete analysis as they are major market players. An *unbalanced panel* dataset has been used in this study.

4.2 Measurement and Interpretation of Variables

Following previous studies that have used profitability, tangibility, size, growth opportunities and operating risk as determinants of leverage (Rajan & Zingales 1995), additional variables of property sector, stapled management structure, and international operations are included in this study to fully capture the setting of A-REITs. These variables are discussed below.

4.2.1 Leverage

A variety of ratios are used to measure leverage, with the most popular being total liability to total assets, total debt to equity, total debt to total assets, and total debt to net assets (Rajan & Zingales 1995). In addition, a flow like measure interest coverage ratio, i.e., the ratio of earnings before interest and taxes (EBIT) to interest expense, is more useful when concerns are raised about the probability of a company repaying its debt. Titman and Wessels (1988) show a significant correlation between book and market values and no significant differences in proxies used. In support of the use of book values, Fama and French (2002) contend that managers usually decide to issue debt or capital structure choices based on book value data because market data are subject to high volatility and market values depend on a number of factors out of the direct control of a firm. In this study, total liability to total assets (TLA), total long-term debt to total assets (LTD), total short-term debt to total assets (STD), and interest coverage ratio (NIE) are used to measure leverage. Short term debt is included because it presents a significant proportion of total debt by property companies; rolling-over short term debt to achieve longer term debt is a common practice in property companies (Brett 1990; Ooi 1999).

4.2.2 Profitability

A common measure of firm profitability is return on assets (ROA) (Brealey et al. 2008). The trade-off and pecking order theories diverge on the relationship between leverage and profitability. According to the trade-off theory, high profitability will increase tax shields and create an incentive for higher leverage. On the other hand, the pecking order theory posits that companies will use internal financing before external sources. Following Myers and Majluf (1984), a negative relationship between profitability and leverage postulated.

4.2.3 Tangibility

Tangible assets are likely to have an impact on the borrowing decisions of a firm because they are less subject to information asymmetries and usually have a greater value in liquidation. Consequently, firms with tangible assets can take on higher leverage (Gaud et al. 2005; Morri & Beretta 2008). From an agent-theory perspective (Jensen & Meckling 1976), lenders demand collateral of tangible assets to avoid suboptimal investments by shareholders as a result of the conflict between lenders and equity owners. The trade-off theory posits that tangible assets serve as good collateral and reduce costs of financial distress. Harris and Raviv (1991) expect that information asymmetries will be large for companies with few tangible assets, in line with the pecking order perspective. Most studies (Gaud et al. 2005; Morri & Beretta 2008; Titman & Wessels 1988; Westgaard et al. 2008) find a significantly positive relationship between tangibility and debt, with Feng (2007) and Grossman and Hart (1982), finding a significantly negative relationship. In this study, the proxy for tangibility is the ratio of the book value of property to total assets (PPT).

4.2.4 Size

The size of a firm is related to the risks and costs of bankruptcy (Ngugi 2008). Larger firms are usually more diversified and therefore bear lower risks of financial distress (Ang et al. 1982); or that their size creates less transparency and greater need for monitoring (Ang et al. 1982; Myers 1984; Myers & Majluf 1984). The former argument suggests a positive relationship between firm size and leverage in line with the trade-off theory and the latter suggests a negative relationship in line with the pecking order theory. Westgaard (2008), Morri (2008), Bond (2006) find a significantly positive relationship between firm size and debt, with Feng (2007) finding firm size to be non-significant in determining leverage. Ooi (1999) finds an inverse relationship between firm size and leverage and further concludes that smaller property companies may not have much choice but to rely on bank loans. Earlier studies have used size to operating revenue, number of employees or the size of total assets as proxies of size. In this study, the proxy for size is the natural logarithm of total assets (TAA).

4.2.5 Growth opportunities

Previous studies have contradicted on the influence of growth opportunities on leverage. According to the trade-off theory, firms with a higher proportion of their market value accounted by growth opportunity will have lower debt capacity because in the case of bankruptcy the value of these opportunities is close to zero (Myers 1977). The pecking order posits that small, high growth firms will face large information asymmetries and will seek to issue securities which minimise such asymmetries. Therefore, high growth firms will issue debt (in particular short term debt). The most popular proxy of growth opportunities is market value-to-book ratio. Other measures used are annual growth rate in total assets (Ooi 1999) and changes of operating revenue from year to year (Westgaard et al. 2008). Changes of share price-to-book value of total assets from year to year are used as proxies of growth opportunities in this study (PPR).

4.2.5 Operating Risk

Operating risk or business risk is defined as variability of expected earnings. High variation in earnings increases the probability of default. Leverage increases the volatility of net profit. Both the pecking order and the trade-off theory predict a negative relationship between operating risk or volatility and the degree of leverage. From a pecking order perspective, firms with high volatility of results try to accumulate cash during good years, to avoid under investment issues in future. The trade-off theory on the other hand posits that firms that have high operating risk can lower the volatility of the net profit by reducing the level of debt. This results in the reduction of bankruptcy risk and an increase in the probability of fully benefiting from tax shields. Some of the commonly used proxies for operating risk are operating income to interest expense, percentage change in EBIT, standard deviation of EBIT scaled by total assets, standard deviation of EBIT to net sales and systematic risk represented by firm β. In this study, standard deviation of EBIT scaled by total assets (SDE) for each firm over the entire period covered is used as a proxy for operating risk.

4.2.6 Other firm attributes: property sector; stapled structure; international investment

Finally, the study also includes other firm specific attributes such as the property sector the listed property company operates in, whether a stapled management structure is adopted and whether it operates internationally. Ooi (1999) shows that the nature of activities and the asset structure of property companies have a significant impact on their debt funding activities. Furthermore, Giambona (2008) show that firms with less liquid assets will choose to use lower leverage and shorter maturity. Therefore, it is hypothesised that the underlying property base

of A-REITs will influence their debt funding activities. In Australia, the stability of cash flows and asset values of the major property types, ranked in order from lowest to highest volatility, is as follows - retail (SER), industrial (SEI), office (SOF), hotel (SEO) (Moody's Investor Service 2003). As discussed earlier this volatility impacts operating risk. To avoid multicollinearity issues, these variables will not be introduced at the same time as operating risk in the models.

Adoption of the stapled management structure[2] (SSS) by Australian listed property trusts (A-REITs) was meant to booster returns (Newell 2006; Tan 2004b). Property development carries higher risk than passive property holding for investment purposes and uses more short-term debt. It is therefore hypothesised that listed property companies with stapled management structures will have a significantly positively relationship with leverage.

The internationalisation of A-REITs was a response to increased geographical diversification and returns and because of a dearth of quality local commercial property to invest in (Tan 2004a). Debt has played a major role in this international expansion. Newell (2006) states that debt levels in some A-REITs with 100% international property have debt levels in excess of 50%, compared to the average debt level of 35%. Despite Newell's (2006) finding that A-REITs with international properties in their property portfolio have not increased their risk profile, market sentiment is that such A-REITs are risky investments resulting in a fall in their share price. Therefore, the study investigates the relationship between listed property company internationalisation (INT) and leverage.

These firm attributes are presented as dummy variables in the models. For example, a dummy variable equal to 1 if the property company has international operations, equal to 0 otherwise.

4.3 Descriptive Statistics

Descriptive statistics regarding the sample are provided in Table 5.

Insert Table 5

[2] Stapled management structure involves funds management and property development, in addition to the traditional passive property holding for investment.

Table 6 shows a correlation matrix for the dataset used in the base case where LTA is the dependent variable. Most of the variables are not highly correlated. However, correlations which are greater than 0.7 represent a potential problem if included in the same models.

Insert Table 6

4.4 Model Specification

Apart from the standard panel data estimation techniques (Gaud et al. 2005; Ooi 1999; Westgaard et al. 2008), other techniques have been used to analyse capital financing behaviour in real estate studies: simultaneous equation model (Giambona et al. 2008), linear regression (Morri & Beretta 2008) and logistic models (Ooi et al. 2008; Ooi et al. 2007). In this study, the panel data estimation technique is adopted. Panel data estimation techniques improve the efficiency of the estimates by providing a larger number of data points and blending characteristics of both cross-sectional and time series data.

The explanatory variables in Section 4.2 are used to proxy for the determinants of A-REITs. It is posited that leverage can be explained by the following variables:

$$\text{Leverage} = f(\text{profitability, tangibles, size, growth, operation risk, stapled structure, international}) \quad (1)$$

The least square dummy variable (LSDV) model similar to Ooi (1999) is used. The LSDV model may be specified as:

$$y_{it} = \alpha_i + \beta X_{it} + v_{it} \quad (2)$$

where:

- y_{it} = represents the dependent variable; subscript *i* denotes the cross-sectional dimension and *t* the time-series dimension.
- α = is a scalar.
- X_{it} = contains the set of explanatory variables in the estimation model.
- β = 11 x 1 column matrix of the partial regression coefficients.
- v_{it} = represents the remaining disturbances in the regression which varies with individual firms and time.

Four proxies are used to measure leverage: total liability to total assets (TLA), total long-term debt to total assets (LTD), total short-term debt to total assets (STD), and interest coverage ratio (NIE). The first three measure the determinants of various debt positions and the last measures the ability to meet interest payments on debts. The use of several debt ratios also acts as a robustness test.

Various models are constructed to investigate the determinants of the various leverage positions of total liabilities, long-term debt, short-term debt, and ability to cover interest payments. Model 1 with TLA as the dependant variable and traditional independent variables found in extant literature is the base case. Other firm attributes such a property sector (PTY), stapled management structure (SSS) and international operations (INT) are added to the base case for models 2-5 using TLA, LTD, STD and NIE as dependant variables.

The unbalanced panel regressions were where carried out in EViews® version 6 (QMS 1997).

5. Empirical Results and Analysis

Five separate, single equation models were estimated by LSDV. The results are given in Table 7. The models explain between 25% and 91 % of the within-sample variance in the dependent variables and the F-statistics show that the models are, overall, strongly significant.

Insert Table 7

In order to maintain brevity, results of the base model with LTD, STD and NIE are not shown as their full models produced better results. Model 2 had the highest R^2 and is the focus of most of the analysis and discussion. Except for the coefficients for tangibility, all the significant regressors have signs which are consistent with a priori expectations.

The negative correlation between ROA and TLA is in line with the pecking order theory which stipulates that more profitable firms have a reduced external need for financing need. Studies that have come to this conclusion are Bond (2006), Gaud (2005), and Rajan (1995). Westgaard (2008) and Hammes and Chen (2004) find a positive relationship, with Ooi (1999) finding it to be entirely insignificant.

Contrary to the pecking theory, the regression results show a negative relationship between leverage and growth opportunities. Ooi (1999) explained this relationship on the basis that firms with a larger proportion of their value accounted for by growth opportunities employ less debt. Furthermore, Rajan (1995) asserts that this finding holds because of the tendency by firms to issue equity when the stock price is relatively high and from the theoretical evidence that financial distress costs are higher for high-growth firms. Other researchers find a positive relationship (Morri & Beretta 2008), and explain this on the basis that growth opportunities add value to a firm, increase its debt capacity and allow a large amount of debt to be taken on (Titman & Wessels 1988).

In all the models, PPT has an anomalous negative sign and is insignificant. This can be partly explained by its high correlation with TAA in Table 6. Furthermore, this result is consistent with Feng et al. (2007) who argue that there should be no relationship between tangible assets and leverage ratios on the basis that REITs are expected to have mostly tangible assets, which results in not much variability in data.

Similar to Morri (2008), a strong negative coefficient of 1.367 which is significant at 7% is found between operating risk (SDE) and leverage (TLA). The result confirms Morri's assertion that leverage ratios are very sensitive to changes in the degree of operating risk borne by REITs. Leverage increases the volatility of net profit. The trade-off theory and the pecking order perspective both recognised this inverse relationship. Westgaard (2008) also arrived at a similar result.

The positive correlation between TAA and TLA is in line with both static trade-off theory and pecking order theory when size is interpreted as a proxy for cost of financial distress (Rajan & Zingales 1995) and as a proxy for information asymmetries (Fama & French 2002; Feng et al. 2007; Rajan & Zingales 1995). Rajan (1995) contend that the probability of bankruptcy is lower for larger firms than it is for smaller firms and that a positive correlation with leverage should be expected. Furthermore, Fama and Jensen (2002) and Rajan (1995) claim that larger firms disclose more information to external investors than smaller ones do.

The results of including property sector dummy variables are inconsistent, with no plausible explanation. Only the retail and industrial property sectors are significant at 1% and 5.7%, respectively. Their inclusion though improved the explanatory power of the determinants of A-

REITs capital structure from 87% (model 2) to 92% (model 2). Bond and Scott (2006) found property type effects to be insignificant.

Both SSS and INT are found to be significantly negatively related to TLA, showing that A-REITs with these features should have lower gearing levels. This result is puzzling as anecdotal evidence has shown that A-REITs with stapled management structures and international operations are much more geared than those with single unit management structures and local operations.

6. Conclusion, Limitations and Future Directions

The study investigates the determinants of A-REITs using panel data analysis techniques. A total of 34 A-REITs, with 199 observations comprise the dataset. Similar studies have been undertaken predominantly on the US REITs market and to knowledge this study is the first of its kind in Australia. A-REITs being the second largest REIT market globally and particularly that debt funding has played a major role in their expansion, shows the significance of the study.

The results show that several determinants influence capital structure of A-REITs. Profitability, growth opportunity, and operational risk are negatively related to leverage while size is positively related. Tangibility is found to be insignificant and property sector effects are inconsistent in various models. Furthermore, industry specific factors of stapled management structure and international operations have significant negative signs, showing that A-REITs with these features should have lower gearing levels. The signs of the determinants show that both pecking order theory and the trade-off theory are at work in explaining the capital structure of A-REITs, although more evidence exists to validate the latter theory. These results are consistent with recent work done by Morri and Baretta (2008), Westgaard, et al. (2008), Feng, et al.(2007), Bond and Scott (2006) on determinants of REITs capital structure. The study also shows that A-REITs issued more public debt than seasoned equity issues at a ratio of 1:1.2 from 2000-2008.

The study though could benefit from further investigation of the roles played by both private and public debt funding in A-REITs. This has not been possible in this study due to lack of data on private debt. With the passage of time and the growth of the A-REITs market, more data will be available for the investigation of effects of different property sectors on A-REIT capital structure.

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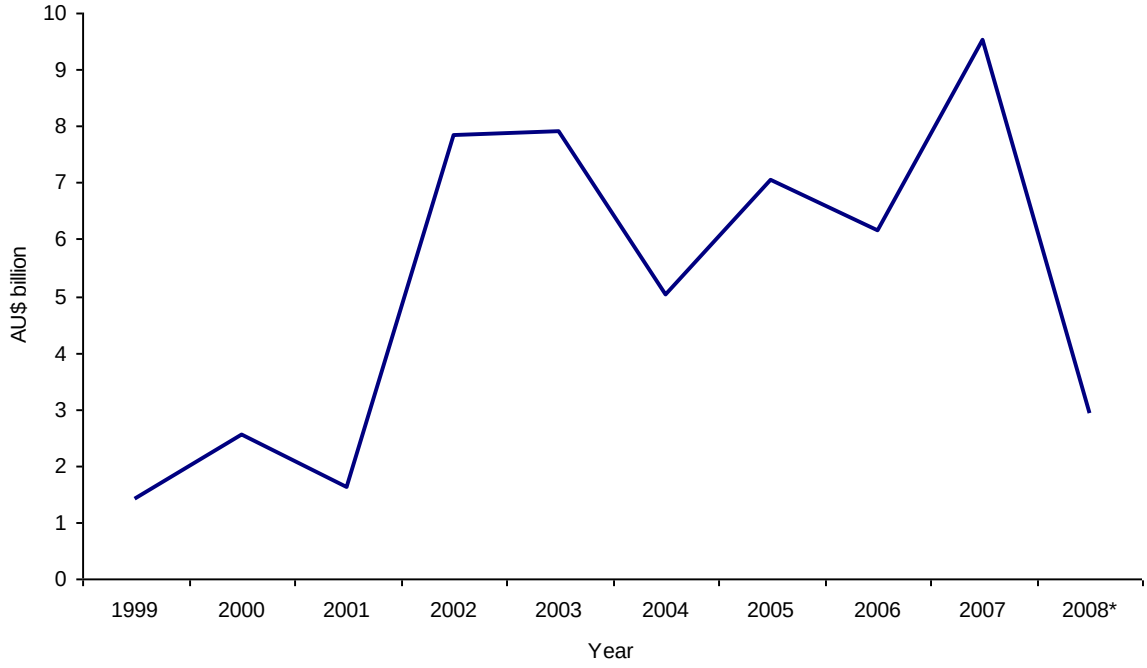
Figure 1: A-REIT Equity Capital Raisings: 1999-2008



*To March 2008

Source: PIR (2008)

Table 1: A-REIT Bond Issuance and CMBS Issuance: 2000-2008

Year	CMBS Issuance		LPT Bond Issuance	
	AU$ million	No. of Issues	AU$ million	No. of Issues
2000	$357	2	$100	1
2001	$1,320	5	$1,615	12
2002	$2,845	19	$1,570	12
2003	$2,191	14	$2,792	28
2004	$1,513	7	$905	9
2005	$2,102	8	$1,320	12
2006	$4,013	11	$1,650	11
2007	$2,500	6	$490	3
2008	$0	0	$0	0
Total	$16,841	72	$10,442	88

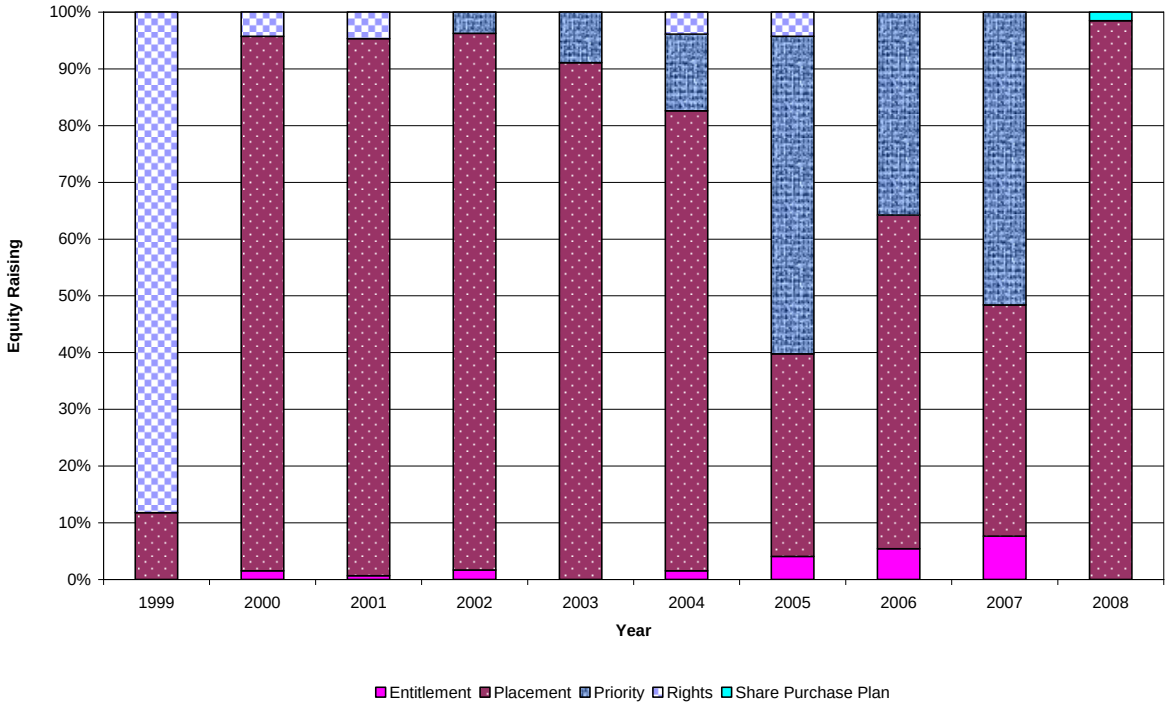
Sources: CMBS issuance: Chikolwa (2007), LPT bonds: Chikolwa (2008a); Author's compilation from various Property Australia magazines (1999-2008)

Table 2: A-REIT Seasoned Equity Issues: 1999-2008

Year	AU$ billion	Percentage
1999	$69	0.3%
2000	$1,291	5.9%
2001	$2,060	9.4%
2002	$3,781	17.3%
2003	$3,494	16.0%
2004	$2,075	9.5%
2005	$2,978	13.6%
2006	$1,980	9.1%
2007	$3,825	17.5%
2008	$325	1.5%
Total	$21,877	100.0%

Source: Author's compilation from Connect 4 Company Prospectuses database (1999-2008)

Figure 2: A-REIT Seasoned Equity Issues: 1999-2008



Source: Author's compilation from Connect 4 Company Prospectuses database (1999-2008)

Table 3: A-REIT Seasoned Equity Issues: October 2008

Date	Company	Amount of Shares
14-Oct	Stockland	56 min
15-Oct	CFS Retail Property Trust	162 min
20-Oct	CFS Retail Property Trust	50 min
23-Oct	GPT Group	1 per 1 entitlement
28-Oct	Goodman Group	17 per 50 entitlement
30-Oct	FKP Property Group	5 per 14 entitlement

Source: EPRA (2008)

Table 4: Expected Sign of Leverage Determinants

	Trade-off Model	Pecking order theory	REITs, previous research
Profitability	+	-	-
Growth	-	+	±
Tangibility	+	+	+
Operating Risk	-	-	+
Size	+	-	+
Property Sector	NA	NA	NA
Stapled Management Structure	NA	NA	NA
International Operations	NA	NA	NA

Source: Adapted from Morri and Beretta (2008)

Table 5: Descriptive Statistics

Variables	Mean	Std. Dev.	Skewness	Maximum	Minimum
Dependent					
TLA	0.367	0.233	0.117	1.000	0.000
LTD	0.225	0.155	0.095	0.611	0.000
STD	0.053	0.096	2.599	0.496	0.000
NIE	13.144	126.182	14.142	1805.070	-18.410
Independent					
ROA	0.050	0.041	-0.147	0.220	-0.118
PPR	0.946	0.634	0.211	3.330	0.000
PPT	0.458	0.384	-0.019	0.993	0.000
SDE	0.024	0.025	1.240	0.112	0.000
TAA	7.589	3.618	-1.576	10.706	0.000

Notes: The summary statistics are based on the final sample of 199 firm-year observations. The dependent variables for the models are the ratio of total liability to total assets (TLA), ratio of long-term debt to total assets (LTD), ratio of short-term debt to total assets (STD), and the interest covergage ratio (NIE). The regressors are profitability: return on assets (ROA); growth opportunities: changes of share price-to-book value of total assets from year to year (PPR); tangibility: ratio of book value of property to total assets (PPT); operating risk: standard deviation of EBIT scaled by total assets for each firm over the entire period covered (SDE); and size: natural logarithm of total assets (TAA).

Table 6: Correlation Coefficients

	ROA	PPR	PPT	SDE	TAA	SER	SOF	SEI	SEO	SSS	INT
ROA	1.00										
PPR	0.50	1.00									
PPT	0.32	0.20	1.00								
SDE	0.26	0.28	0.07	1.00							
TAA	0.56	0.70	0.58	0.41	1.00						
SER	0.07	0.01	0.20	0.16	0.23	1.00					
SOF	0.08	0.00	0.32	0.01	0.18	-0.14	1.00				
SEI	0.03	0.09	0.17	0.05	0.14	-0.11	-0.09	1.00			
SEO	0.20	0.36	-0.18	0.29	0.20	-0.22	-0.19	-0.14	1.00		
SSS	0.43	0.43	0.10	0.26	0.45	-0.01	-0.14	-0.09	0.03	1.00	
INT	0.22	0.23	0.31	0.33	0.49	0.25	0.18	0.28	-0.12	0.11	1.00

Notes: The pairwise correlation coefficients are based on the final sample of 199 firm-year observations. The regressors are profitability: return on assets (ROA); growth opportunities: changes of share price-to-book value of total assets from year to year (PPR); tangibility: ratio of book value of property to total assets (PPT); operating risk: standard deviation of EBIT scaled by total assets over the entire period covered (SDE); size: natural logarithm of total assets (TAA); property sector*: retail sector dummy variable of 1 or 0 otherwise, office sector dummy variable of 1 or 0 otherwise, industrial sector dummy variable of 1 or 0 otherwise, other property sectors, e.g. hotel, dummy variable of 1 or 0 otherwise; stapled management structure dummy variable of 1 or 0 otherwise; and international operations dummy variable of 1 or 0 otherwise.

*The diversified property sector has been excluded.

Table 7: LSDV Regression Results

		*[1] TLA**			*[2] TLA*			*[3] LTD*			*[4] STD*			*[5] NIE*		
Variable	*Expected Sig*	*Coeff.*	*t-Stat.*	*Prob.*	*Coeff.*	*t-Stat.*	*Prob.*	*Coeff.*	*t-Stat.*	*Prob.*	*Coeff.*	*t-Stat.*	*Prob.*	*Coeff.*	*t-Stat.*	*Prob.*
Intercept		-0.042	-2.149	0.033	-0.082	-3.857	0.000	0.000	-0.017	0.986	-0.014	-0.680	0.498	-35.135	-1.015	0.312
ROA	-	-0.374	-1.512	0.133	-0.447	-2.120	0.036	-0.212	-1.005	0.316	-0.151	-0.743	0.459	-132.585	-0.388	0.699
PPR	-	-0.067	-3.334	0.001	-0.031	-1.839	0.068	-0.043	-2.557	0.012	-0.027	-1.670	0.097	7.954	0.289	0.773
PPT	+	-0.040	-1.159	0.248	-0.022	-0.710	0.479	-0.007	-0.217	0.828	0.032	1.111	0.268	13.238	0.269	0.789
SDE	-	-0.466	-0.673	0.502	-1.367	-1.828	0.070	1.025	1.373	0.172	-0.486	-0.676	0.500	187.410	0.155	0.877
TAA	+	0.069	12.796	0.000	0.102	12.669	0.000	0.053	6.577	0.000	0.014	1.767	0.079	-4.398	-0.337	0.737
SER					0.270	4.837	0.000	-0.020	-0.358	0.721	0.011	0.203	0.839	-4.726	-0.052	0.958
SOF					-0.113	-1.243	0.216	-0.261	-2.868	0.005	-0.019	-0.214	0.831	447.153	3.029	0.003
SEI					0.085	1.466	0.145	0.009	0.150	0.881	0.030	0.544	0.588	-5.063	-0.054	0.957
SEO					0.117	1.921	0.057	-0.167	-2.766	0.006	0.083	1.425	0.156	9.903	0.101	0.920
SSS	+				-0.359	-7.102	0.000	-0.152	-3.017	0.003	0.011	0.222	0.825	18.805	0.230	0.819
INT	+				-0.242	-4.085	0.000	-0.007	-0.126	0.900	-0.063	-1.106	0.270	22.891	0.239	0.812
R^2		0.865			0.915			0.802			0.539			0.253		
F-stat.		27.899			37.764			14.173			4.087			1.187		

Notes: Estimation results of LSDV regression on 199 firm-year observations. The dependent variables for the models are the ratio of total liability to total assets (TLA), ratio of long-term debt to total assets (LTD), ratio of short-term debt to total assets (STD), and the interest covergage ratio (NIE). The regressors are profitability: return on assets (ROA); ; growth opportunities: changes of share price-to-book value of total assets from year to year (PPR)tangibility: ratio of book value of property to total assets (PPT); operating risk: standard deviation of EBIT scaled by total assets for each firm over the entire period covered (SDE); size: natural logarithm of total assets (TAA); property sector dummy variables of 1 or 0 otherwise: retail (SER), office (SOF), industrial (SEI); stapled structure management dummy varaible of 1 or 0 otherwise (SSS); and international operations dummy variable of 1 or 0 otherwise. The F-stat. is the result of the analysis of variance tests on the null hypothesis that there is no linear relationship between the dependent and independent variables.