Determinants of Capital Structure of A-REITs and the Global Financial Crisis

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Abstract

This paper contributes to the capital structure literature by investigating the determinants of capital structure of Australian Real Estate Investment Trusts (A-REITs) over the period 2006-2009. We partition capital structure into total leverage, long term leverage and short term leverage, and subsequently analyse their determinants prior to the Global Financial Crisis (GFC) shock (2006-2007) and after (2008-2009). We find that a diverse range of explanatory variables impact differently upon the term of leverage, and that the GFC has provided an unique environment which has forced managers to alter their long term strategy on capital structure.

1. Introduction

Past international studies of capital structure have yielded mixed results despite being performed during relatively stable economic periods. If one is to draw back on Modigliani and Miller (1958, 1963), this is not surprising given their assertion that capital structure is irrelevant to maximising the value of a company. Using an example, if two companies are identical in every way with one made up of 100% equity, and the other partially levered, their values will be identical. This is true because an investor could purchase the full equity company using some of their own funds and borrowing the rest themselves. Their net equity position would be the same either way, assuming that there is no difference between their personal cost of debt and that of the company. However in practice, the Global Financial Crisis (GFC) has exposed the failures of many highly levered entities, and urgent restructuring has placed doubt on the ability of Modigliani and Miller's seminal work to remain robust over the vagaries of the global economic system. Determining the appropriate capital structure is not done in a static world. As has been seen many times over in the past, the financial world is susceptible to events that change the course of decision making for years to come, and every manager makes a decision where there is a trade off of one benefit or cost for another. The most recent event to affect the corporate world was the GFC. At the height of the economic cycle, liquidity was at its peak, and this abundance of funding impacted on disciplined lending, re-financing and underwriting by many financial institutions, particularly in the evaluation of borrowers' capacity to repay. Further compounding this effect was reliance on rising asset values and persistently low interest rates. Once the property bubble burst in the United States, house values fell and were followed by defaults among over-leveraged borrowers. The opaqueness of the underlying financial instruments and their trading on over-the-counter markets both nationally and internationally made losses hard to locate (LDW 2008). In terms of structural issues, there was over-reliance on self regulation, especially with the dramatic rise of non-bank financial institutions, and risk management was trivialised with increasing use of synthetic products and collateralised debt obligations. In summary, there was a trade off between expected higher efficiency of financial intermediation and the stability of the financial system, particularly with lack of due diligence emanating from compensation of excessive managerial risk taking. This phenomenon ultimately spread via transaction cost reduction, the subsequent rise in cross-border operations, and lack of co-ordinated global regulation.

The GFC has had a tremendous impact on the Australian listed property sector, with market values having dropped in 2008 by an average of 65% from its peak a year earlier. Returns also suffered, dropping from an average of 20% just prior to the GFC to -50% in 2008-2009. A-REITs have traditionally been highly levered, with the debt levels rising from 30% in 2001 to 52% in 2009 in pursuit of growth opportunities. Thus the scarcity of capital post GFC and

the cost of debt remaining on offer has caused much doubt about how they will manage to continue operating when it comes time to re-finance. As a result, there have been over $15 Billion worth of capital raisings since September 2008 in an attempt to reduce exposure to debt and reduce downward pressure on asset valuations. With a drop in asset values, the likelihood of breaching debt covenants is increased, making equity issues even more critical.

The credit crunch post GFC has led to prohibitive debt pricing, especially given that Australian banks have over $46 Billion of exposure to A-REITs. The decline in collateralised asset values, rental income and increases in costs have placed doubt on the viability of A-REITs needing to refinance. With foreign banks exiting this sector after the initial shock, the $4 Billion Australian Investment Business Partnership has been developed to support high quality Australian assets in need of funding. Lumsden et al (2009) state that the current environment is likely to make many features of the previous model difficult to replicate and will almost inevitably lead to a substantial review of the A-REIT structure.

In this paper, we attempt to find the contemporary determinants of capital structure of Australian A-REITs between 2006 and 2009, specifically examining both short and long term financing decisions. We break the sample up over two periods, on either side of the GFC shock in an attempt to find out how such a crisis alters the relationship between leverage and its explanatory variables. This paper is organised as follows. Section 2 provides an overview of the major theories and past empirical findings. The overwhelming majority of work thus far has focused on an international context. Section 3 addresses our methodology and describes the variables and their rationale for inclusion. We present hypotheses based on theory and other expectations unique to the Australian market. Section 4 explains the data, presents regression results and gives a full interpretation of our findings. Section 5 provides a concluding overview.

2. Literature Review

Modigliani and Miller's 1958 paper hypothesised that capital structure has no impact upon the value of the firm, given perfect capital markets, no taxes, bankruptcy, nor transaction costs. They then introduced corporate taxes and showed that firm value and its degree of leverage is positively correlated (Modigliani and Miller 1963). Miller then introduced the impact of both corporate and personal taxes to show that despite tax deductibility, the value of a firm and its structure are independent (Miller 1977). Since these discussions, there have been a plethora of studies conducted, many with conflicting results. The literature is currently based around two primary theories. The trade off model developed by Kraus and Litzenberger (1973) states that every firm maximises value by choosing an optimal debt to equity ratio. As the firm increases leverage, the trade off occurs by means of attaining tax deduction benefits on interest paid and having access to additional capital

without diluting the shareholder base. On the other hand, the firm assumes a greater risk of insolvency and bankruptcy costs by not being able to cover interest repayments. They are also formally monitored to a greater extent by lenders and may have restrictive covenants placed on them. The theory predicts that larger, more profitable firms are more likely to take on debt because they are financially healthier, with a lower probability of going bankrupt. They can also command lower rates of interest due to their greater scale of collateral. Stulz (1990) contends that the correct trade off between costs and benefits of debt leads to an optimal capital structure. Conversely, the Pecking order theory states that an optimal debt level does not exist. Rather, choices of capital depend on their cost, with internal funds being preferred to debt finance, and equity issues coming last (Myers 1984, Myers and Majluf 1984). Therefore, debt should only be undertaken in the absence of acceptable cash flow. There is also an asymmetric information problem whereby firms can reduce outside stakeholder scrutiny by using internal funds. The market timing theory first postulated by Baker and Wurgler (2002) suggests that there is no optimal capital ratio. Rather, firms will choose the type of capital that is mispriced to a greater extent. In terms of equity, a firm would be expected to make an offering when their existing share price is unsustainably overvalued in order to minimise their cost of equity and cause the least negative impact to existing share holders. Fama and French (1998) concur with Miller that debt offers no net tax benefits, and find a positive relationship between dividends and firm value, whilst there is a negative relationship between firm value and debt levels.

Jensen and Meckling (1976) hypothesise that there is conflict between firm owners and both managers and debt holders. In particular, managers strive to maximise their own gains using company resources, whilst not expending effort in the best interests of their principal equity holders. In this case it is optimal for the firm to pay out all their free cash flow in dividends to avoid any risky and inefficient investment. Consequently it is more beneficial to fund expansion using debt such that its utilisation can be formally monitored by the lender. Shareholders also indirectly gain the benefit of this type of monitoring (Jensen 1986). Kim and Sorensen (1986) find that high-growth firms have a lower debt ratio, whilst debt has a positive relationship with operating risk but no relationship with firm size.

With regard to previous empirical work determining capital structure, Bradley et al (1984) found that certain debt ratios depend on the industry the firm belongs to. Geltner and Miller (2001) assert that given the higher net tangible asset values in REITs, they can afford to be more highly geared than non-property related companies, whilst Myers (1985) concluded that the net tax gain to corporate borrowers is negative if their net marginal tax rate is zero. Given A-REIT tax rules, this implies that results are likely to be mixed. Capozza and Seguin (1999) found that externally managed REITs have a higher debt ratio because external managers are frequently compensated according to the size of assets under management. This gives them every incentive to gear up as much as possible to maximise their own personal remuneration, whilst internal managers are more concerned about escalating interest expenses.

Deesomsak et al (2004) found that growth opportunities, non debt tax shield, liquidity and share price performance have a negative effect on leverage, whilst firm size has a positive effect, supporting many predictions made by capital structure theories. In their study, managers tend to make different decisions on capital structure internationally where there are different country considerations. They also found that the impact by explanatory variables was altered by Asian financial crisis.

According to Giambona et al (2008), REITs with a high market to book value have a lower debt ratio and tend to use shorter maturity debt to avoid underinvestment. Morri and Berretta (2008) support Pecking order theory by finding that more profitable firms, those with a high degree of operating risk, and those with low growth opportunities tend to use less debt. They also find that diversified REITs have low collateral value and less debt, appealing less to investors who generally prefer specialisation in one area of investment.

Finally, Chikolwa (2009) studied a sample of 34 A-REITs and found that profitability, growth opportunities and operational risk are negatively related to leverage, whilst size is positively related. He also finds merit in both Pecking order and Trade off theories, with greater emphasis on the latter, and consistency with Westgaard et al (2008), Feng et al (2007), and Bond and Scott (2006).

3. Methodology, hypotheses and variable definitions

In order to determine the catalysts of capital structure, each trusts leverage ratio is set as a function of a number of theoretically relevant trust-specific financial ratios. Ordinary least squares estimates the equation in the following form:

$$L_{i,t} = \alpha_0 + \qquad FF_{k,i,t-a} + \varepsilon_{i,t}$$

Where $L_{i,t}$ is trust i's leverage at time t, measured at the financial year end, June 30. $FF_{k,i,t-a}$ is a vector of k trust i's specific ratio factors, averaged over the previous a years to reflect the medium to long term nature of the capital structure decision (Deesomsak et al, 2004; Rajan and Zingales, 1995; Pandey, 2001). Averaging variables assists in minimising measurement error and disturbing effects of random fluctuations, particularly over a relatively short sample period. This is especially vital in our sample, which had to be restricted to four financial years due to the small number of A-REITs continuously listed on the Australian

Securities Exchange around the time of the GFC. The trust-specific independent ratio variables include financial health, trust size, interest coverage, growth opportunities, operating risk, historical growth, tangibility, profitability, liquidity, share price performance, diversity of property industry operations, global investment and non-debt tax shield. These variables have previously been used with varying degrees of success in the literature both in Australia and abroad. Table 1 provides a brief summary of relationships between leverage and the independent variables as predicted by theory and compiled by Deesomsak (2004).

The dependent variable, leverage, is expressed in three different ways. One of the most common ratios used is Total Liabilities to Total Assets (Rajan and Zingales 1995). We also use a further two ratios: Total Non Current Liabilities to Total Assets, and Total Current Liabilities to Total Assets. The latter is used because it is common in real estate-related companies to roll over short term debt in order to transform it into longer term debt (Brett 1990; Ooi 1999). In our sample, short term debt makes up almost a third of total debt (14.7% out of the mean 47.3%). Long term debt is used as it is the primary means of securing debt finance for long term property assets.

Most previous studies have used size, growth opportunities, operating risk, tangibility, and profitability as variables due to their ability to test the large body of capital structure theory Rajan and Zingales 1995; Chikolwa 2009). We have also used these variables and added several others such as Altmans Z-score, liquidity, non debt tax shields and share price performance to add further insight. We also include 2 dummy variables in an attempt to capture the impact that global and industry-diversified operations have on capital structure.

Altmans Z-score was designed to predict whether a firm will enter bankruptcy within two years (Altman 1968). It is therefore a measure that gauges the financial health of a company. The score is calculated using the following formula: Z-score = $1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$ where X_1 is working capital divided by total assets, X_2 is Net profit after tax divided by total assets, X_3 is Earnings before interest and tax divided by total assets, X_4 is Market value of equity divided by book value of total liabilities, and X_5 is Revenue divided by total assets. We acknowledge that in raw form, certain elements of this formula contain measures of profitability, liquidity and growth opportunities. However Altmans Z-score in its entirety can be construed as a measure of bankruptcy risk, and correlation analysis within our sample shows that its relationship to all other explanatory variables is quite low with a

Table 1

Theories and the expected relationship between corporate factors and firm leverage

Variables	Expected theoretical relationship	Mostly reported in the empirical literature	Theories
Tangibility	+	+	Agency theory: agency cost of debt. Tradeoff theory: financial distress/business risk
Profitability	-	-	Pecking order theory. Tradeoff theory: bankruptcy costs. Other theory: dilution of ownership structure
	+		Tradeoff theory: tax. Free cash flow theory. Signalling theory
Firm size	+	+	Tradeoff theory: bankruptcy costs/tax. Agency theory: agency costs of debt. Other theories: access to the market, economies of scale
	-		Other theory: information assymmetry
Growth opportunity	-	-	Agency theory: agency cost of debt. Tradeoff theory: financial distress
	+		Signalling theory. Pecking order theory
Non debt tax shield	-	-	Tradeoff theory: tax
Liquidity	-	-	Agency theory: agency cost of debt. Free cash flow theory. Pecking order theory: use of internal resources
	+		Other theory: ability to meet short term obligations
Earnings volatility/ risk	-	-	Tradeoff theory: financial distress
	+		Agency theory
Share price performance	-	-	Market timing theory

maximum correlation coefficient to an included variable of 0.32. To the best of our knowledge, this is the first time that the Z-score has been used to explain capital structure. With respect to the anticipated relationship, a declining Z-score means a higher probability of insolvency. From a borrower's perspective, this would be expected to raise the cost of debt financing, making it less desirable or even impossible to utilise. Therefore a decrease in the Z score should result in decreased debt usage, eliciting a positive relationship. Despite this expectation, Agency theory and asymmetric information would suggest that an entity facing imminent distress may borrow further to fund dividend payments in order to appease shareholders. They are the entity's primary fiduciaries and this relationship is mandated by Corporations Law. In light of both a low Altmans Z- score and low or negative profitability, borrowing to fund asset acquisitions may be increased as not to dilute an entity's shareholding in an attempt to trade out of probable bankruptcy. It is also plausible that equity issues under these conditions may be accepted only at a substantial discount, leading to an inflated cost of equity to the entity. If these costs rise above the inflated cost of debt, then this trade off would suggest that a lowering Z-score would lead to increasing debt ratios.

Firm size is measured by the natural log of total assets. Larger entities are expected to have greater sources of revenue and therefore face lower risk of bankruptcy and as such, lower expected costs of bankruptcy. Large firms are subject to a greater number of debt covenants and scrutiny, therefore face smaller monitoring costs and agency costs generally. Large entities also tend to have less variation in cash flows, cheaper access to the credit market, and higher tax shields for those that do not meet the 90% minimum earnings distribution requirement. The Trade off theory therefore postulates that larger entities will borrow more due to their lower cost of debt, making this relationship likely positive.

Profitability can be measured in several ways. We decided to use either Net Profit After Tax divided by Equity, or Earnings Before Interest, tax, Depreciation and Amortisation divided by Total Assets. According to Pecking Order Theory, managers prefer to fund projects using retained earnings because they are generally cheaper than external finance, and the resulting inflated information asymmetry between managers and external stakeholders of using internal funds. Furthermore, high profitability allows entities the leisure of using internally generated funds, and therefore diminish use of both external debt and equity, creating a negative relationship. On the other hand, the unique tax rule applicable to A-REITs provides a large disincentive to retain earnings, therefore this aspect of the Pecking order theory does not apply as fluidly as it would expect to be applied to standard companies. The major trade off thus appears to be the cost of imposed taxes if high earnings are retained, versus the cost of debt if these earnings are paid out.

The Interest coverage ratio approximates the ability of an entity to pay its interest obligations with earnings. It is defined as Earnings Before Interest, Tax, Depreciation and Amortisation divided by Interest expense. If earnings relative to interest are low, then the

entity is at greater risk of insolvency. Sign expectancy can be argued as it is for Altmans Z-score. It is interesting to note that Chikolwa 2009 in his excellent paper uses this variable as a flowing measure of leverage for entities who may experience trouble paying off their debts. The majority of his explanatory variables however appear to be highly insignificant in explaining interest coverage and therefore in a study focusing generally on A-REITs with no specific financial struggles, we will limit its use to being explanatory.

Growth opportunities are usually measured in two ways. Firstly, Book Value of Total Assets less Book value of Equity plus Market Value of Equity, divided by Book Value of Total Assets. Secondly, Market Value of Equity divided by Book Value of Equity. We chose Market Value of Equity to Book Value of Equity arbitrarily in our models because as expected, they correlated highly and yielded similar results. Higher growth opportunities provide incentives to management to invest sub optimally by accepting risky projects with a high risk to return ratio (or have a high coefficient of variation) that may put debt holders at higher risk. This results in cost of debt rising such that use of internal funds or equity are preferred subject to taxation costs and the prevailing cost of external equity. In addition, intangible growth opportunities place the ability of managers to service additional debt in doubt. As a result, a negative relationship is expected. Alternatively, legitimate low risk A-REIT growth opportunities may need to be funded with debt if the cost of debt is lower than taxation obligations triggered by retaining earnings. In this instance, a positive relationship is expected.

Operating risk is defined as the standard deviation of EBIT scaled by Total Assets. If an entity's earnings become uncertain, then so does their ability to repay debt obligations. Therefore, a negative relationship is expected. This variable correlates highly with profitability and had to be omitted on this occasion, however we note that upon inclusion in our models at the expense of profitability, it was negatively significant at the 1% level in all time periods, with higher coefficients after the GFC.

Growth is defined as the percentage change in total assets from the previous year. If growth is positive and has a positive effect on the debt ratio, then we can assert that A-REITs are generally inclined to use debt funding for any expansion. Any differences in sign should become apparent when distinguishing between debt use in stable or in more critical financial environments. For example, post GFC when credit is restricted and more expensive, this variable is expected to be either negative or insignificant.

Tangibility is defined as the ratio of Tangible Assets to Total Assets. Agency theory hypothesises that entities with a high degree of borrowing are more inclined to invest inefficiently and transfer wealth from debt holders to equity holders. In return, lenders require collateral to hedge their own lending risk if they are to continue. Therefore, as risky lending increases, the number of tangible assets should also increase to prevent any decrease in entity liquidation value should bankruptcy occur. The alternative is that A-REITs

that have intangible assets but cannot match collateral requirements imposed on them, must borrow at higher cost or raise more equity (Scott 1977).

Liquidity is defined as the ratio of Current Assets to Current Liabilities. Pecking order theory predicts that entities with high liquidity will borrow less and managers may manipulate liquid assets in favour of shareholders, away from debt holders, increasing the agency costs of debt (Deesomsak et al 2004; Harris and Raviv 1991). Therefore, a negative relationship is expected.

Share price performance is defined as the percentage change in average annual share price. This variable has been included to measure the expected impact on leverage of dramatic falls in market capitalisation post GFC. Theory-wise, new equity is expected to be issued at a discount, given the information asymmetry that exists between managers and potential investors. It is expected that entities would prefer to delay the issue of new equity until share prices are relatively high so as to minimise the impact of discounting on the amount of capital they raise. This hypothesis stems from Market timing theory (Baker and Wurgler 2002), and therefore when share price performance increases, the debt ratio should decrease. Alternatively, further equity issues will dilute the shareholder base, so if these concerns dominate, there may be no significant impact.

Diversification of property investment over different industries has been shown to have an impact on debt funding (Ooi 1999), and entities with less liquid assets prefer a lower level of debt over a shorter loan period (Giambona 2008). Diversifying a portfolio of properties across multi sectors will reduce operating risk and therefore the cost of debt. It is expected that A-REITs with a diversified portfolio of properties will be able to borrow more. This variable is introduced as a dummy, with a value of 1 if there is diversification, and 0 if investment occurs within a single sector.

Internationalising property investment opens up profitable opportunities on one hand, but also exposes A-REITs to a multitude of political and economic risks. Many A-REITs undertook overseas acquisitions prior to 2008 when the market was at its peak (BDO 2010). Empirical evidence has shown that A-REITs with a high international exposure have significantly higher debt levels (Newell 2006; Chikolwa 2009), yet have not increased their risk profile (Newell 2006). Despite this, exposure to countries that have been affected by the GFC is expected to impact on unit holder sentiment, especially when those asset values fall. In fact, the biggest falls in market value have been recorded by those A-REITs with exposure to weak off-shore markets and high levels of debt (Lumsden et al 2009). Given previous empirical evidence, debt levels are expected to rise with greater degrees of international exposure but only during stable economic conditions.

4. Data and Empirical Results

4.1. Data

Of our financial data for A-REITs, we initially consulted the finance section of The Australian Newspaper to extract all A-REITs currently listed on the Australian Securities Exchange. As at April 2010, there were 59 A-REITs listed. Our aim was to collect data for 3 years on either side of the GFC in order to gauge the differences in results that an unstable financial period may evoke. We found that over these years, there was a large turnover of A-REITs on the ASX and we were able to secure a statistically sound sample of 42 over 4 years. Financial statement data was taken from both trust websites and the Finanalysis database of company reports. We then calculated various ratios using this data. We next consulted Bloomberg for daily share and unit prices. However, despite our A-REITs being listed, much of the Bloomberg data was sporadic and unpublished. As a consequence, we could only use 32 A-REITs. After omitting Centro due to severe data fluctuations and outliers, we settled with a sample size of 31. Table 2 shows our sample of A-REITS used over the period 2006 to 2009, whilst table 3 provides descriptive statistics for the three dependent and the thirteen independent variables. We note that due to instability brought about by the GFC, several individual A-REIT observations lie slightly over three standard deviations away from their means. However, we included them in order to maintain minimum sample size integrity. Table 4 shows all of the non-dummy independent variables and their correlation coefficient relationships. In order to rid the problem of multicollinearity, we omitted variables that were highly correlated, adhering to minimum - maximum limits of -0.6 to +0.6. The omissions were based on those variables that least contributed to our models or were correlated with multiple other variables.

4.2 Empirical Results and Analysis

Our results are separated into determinants of overall capital structure (table 5), long term gearing (table 6), and short term gearing (table 7). For each, medium to long term structure (2006-2009) is compared to short term structure (2006-2007) prior to the GFC, and short term structure (2008-2009) showing any impact that the GFC has had. Deesomsak 2004 analysed the impact of the Asian Financial Crisis on Australian companies, but also stated that this crisis itself had no impact on Australia in general. To our knowledge ours is the first study incorporating the effects of a relevant financial crisis in Australia.

Table 2

List of A-REITs included in the sample

Name	ASX Code
Abacus Property STP	ABP
Agricultural Land Unt	AGJ
ALE PRP GRP STP	LEP
Aspen Grp STP	APZ
Astro Jap Prop STP	AJA
Aust Education UNT	AEU
Bunnings Warehouse UNT	BWP
Carindale Prop UNT	CDP
CFS Retail Prop UNT	CFX
Challenger Winetr UNT	CWT
Commonwealth Prop Ord UNT	CPA
Coonawarra Aust UNT	CNR
GEO Prop Grp STP	GPM
Goodman Grp Forus	GMG
GPT Grp STP	GPT
ING Industrial Fd UNT	IIF
ING Office FD STP	IOF
ING Re Com Grp STP	ILF
ING Real Est Ente UNT	IEF
Living & Leisure Grp STP	LLA
Mirvac Grp STP	MGR
Rabinov Prop Tr UNT	RBV
RNY Prop Tr UNT	RNY
Stockland STP	SGP
Thakral Holdings UNT	THG
Tishman Speyer UNT	TSO
Trafalgar Corp STP	TGP
Trinity Grp STP	TCQ
Valad Prop Forus	VPG
Westfield Grp STP	WDC
Westpac Office Tr UNT	WOT

Table 3

Descriptive statistics

Variables	Mean	Median	Minimum	Maximum	Std. Dev.
Dependent					
TLTA	47.3001	48.9953	8.2523	73.3413	15.7897
TNCLTA	32.5822	29.8592	0.0000	65.1241	15.1434
TCLTA	14.7179	10.2136	2.7878	70.1823	13.8795
Independent					
ALTMANSZ	1.0514	0.9791	-0.5101	3.7211	0.9150
Size	20.7831	20.5493	17.0888	24.6469	1.5870
NPATE	-8.2150	1.6513	-115.8057	18.8774	29.0781
EBITDAINT	2.0563	2.6047	-35.4982	20.1572	8.4625
MVBV	0.9253	0.8613	0.4747	2.0606	0.3248
OPRISK	0.1387	0.0954	0.0145	0.6057	0.1178
GROWTH	60.6033	15.1326	-4.3576	972.3923	176.5041
NTATA	87.5223	91.1472	53.6360	99.9538	12.6005
EBITDATA	1.2050	4.0934	-44.8553	13.2254	10.8195
CACL	1.3247	1.0632	0.0006	3.6479	1.0330
NDTS	0.1558	0.0000	0.0000	3.0494	0.5503
SPP	-10.7395	-10.4693	-29.5992	14.7003	11.3673
GO	0.9657	0.9505	0.5862	1.3339	0.1626

Note: NPATE, GROWTH, NTATA, EBITDATA, NDTS and SPP are expressed in raw percentages.

Table 4

Correlation Coefficients

	ALTMANSZ	Size	NPATE	EBITDAINT	MVBV	OPRISK	GROWTH	NTATA	EBITDATA	CACL	NDTS	SPP	GO
ALTMANSZ	1.00												
Size	0.07	1.00											
NPATE	0.40	0.10	1.00										
EBITDAINT	-0.16	0.15	0.30	1.00									
MVBV	-0.12	0.46	0.10	0.30	1.00								
OPRISK	-0.14	0.04	-0.88	-0.42	0.01	1.00							
GROWTH	-0.28	-0.16	-0.20	-0.03	-0.19	-0.09	1.00						
NTATA	0.21	0.20	0.30	0.13	0.15	-0.12	-0.34	1.00					
EBITDATA	0.26	0.08	0.89	0.52	0.02	-0.92	-0.01	0.27	1.00				
CACL	-0.14	-0.21	-0.11	-0.10	-0.20	0.09	-0.02	-0.47	-0.15	1.00			
NDTS	-0.30	-0.09	-0.28	-0.06	-0.11	0.00	0.94	-0.37	-0.12	-0.07	1.00		
SPP	0.32	0.35	0.39	0.49	0.50	-0.19	-0.39	0.32	0.40	-0.22	-0.36	1.00	
GO	-0.31	0.49	-0.06	0.37	0.93	0.08	-0.14	0.03	-0.05	-0.07	-0.07	0.47	1.00

Note: Dummy variables have been excluded.

	Table 5											
							Dependent Variable TLTA					
				2006-2009				**2006-2007**			**2008-2009**	
Variable	Expected Sign		coeff	t-stat	Prob		coeff	t-stat	Prob	coeff	t-stat	Prob
Intercept			100.9370	3.8145	**0.0012**		49.6644	1.1134	0.2794	81.7577	2.8605	**0.0100**
ALTMANSZ	+	-	-16.3362	-8.6563	**0.0000**		-12.1844	-6.5539	**0.0000**	-20.0112	-6.8704	**0.0000**
SIZE	+		-2.2116	-1.9919	**0.0609**		-0.6299	-0.4738	0.6410	-1.8039	-1.3292	0.1995
EBITDAINT	+	-	-0.3746	-1.6209	0.1215		0.3737	1.5846	0.1296	-0.0303	-0.2321	0.8189
MVBV	-		7.0996	1.0163	0.3223		1.3223	0.3024	0.7656	15.3612	1.4097	0.1748
GROWTH	+	-	0.0061	0.6656	0.5137		0.0086	1.7366	**0.0986**	-0.0221	-0.1392	0.8908
NTATA	+		0.0150	0.1120	0.9120		0.3372	1.2143	0.2395	-0.0011	-0.0088	0.9931
EBITDATA	+	-	0.6716	4.0243	**0.0007**		-1.0570	-1.3903	0.1805	0.9389	6.0961	**0.0000**
CACL	-		1.2085	0.7422	0.4671		1.1754	0.5281	0.6036	0.9547	0.6247	0.5396
SPP	-		0.1202	0.5448	0.5923		0.3142	2.1427	**0.0453**	-0.3421	-1.3169	0.2035
DIV	+		0.1510	0.0431	0.9661		0.4606	0.1194	0.9062	-4.1181	-0.9593	0.3495
GLOBAL	+		1.6128	0.4070	0.6886		1.2852	0.3567	0.7253	-2.7662	-0.5498	0.5889
R^2			0.7913				0.7921			0.7817		
F-stat			11.3422				11.3881			10.7667		
Jarque-Bera	stat		1.7976				1.0105			1.8539		
	Prob		0.4070				0.6034			0.3958		
White	F-stat		0.8662				2.9189	*Corrected for		1.1107		
	Prob		0.6259				0.0425	heteroskedasticity		0.4499		
Ramsey	F-stat		9.5257				42.5061			0.1388		
	Prob		0.0064				0.0000			0.7138		

Notes: The above are estimation results of ordinary least squares regression on 124 observations. The dependent variables are the ratio of total liabilities to total assets (TLTA), the ratio of long term debt to total assets (TNCLTA), and the ratio of short term debt to total assets (TCLTA). The independent variables are financial health: proxied by Altmans Z score (Altmansz); Size: natural logarithm of total assets (Size); Interest coverage ratio: EBITDA divided by interest expense (EBITDAINT); market perceptions of growth opporunities: total market capitalisation divided by book value of equity (MVBV); growth rate of company assets: percentage growth relative to the previous year (GROWTH); tangibility: book value of tangible assets divided by total assets (NTATA); profitability: EBITDA divided by total assets (EBITDATA); liquidity: current assets divided by current liabilities (CACL); market perceptions of performance: percentage growth in share price relative to the previous year (SPP); diversification of property investment across different industries dummy variables of 1 or 0 otherwise (DIV); international diversification of investment dummy variables of 1 or 0 otherwise (GLOBAL). The F-stat is the result of analysis of variance tests on the null hypothesis that there is no linear relationship between the dependent and independent variables. The R^2 shows the proportion of movement in the dependent variables that can be explained by the independent variables. Three models are given for three periods: 4 years between 2006 and 2009 (2006-2009), 2 years preceeding the commencement of the Global Financial Crisis (2006-2007), and 2 years after the commencement of the Global Financial Crisis.

	Table 6												
							Dependent Variable TNCLTA						
				2006-2009				2006-2007				2008-2009	
Variable	Expected Sign		coeff	t-stat	Prob		coeff	t-stat	Prob		coeff	t-stat	Prob
Intercept			21.0273	0.5101	0.6159		-8.9659	-0.2140	0.8328		-10.5423	-0.2091	0.8366
ALTMANSZ	+	-	-12.3201	-6.6061	**0.0000**		-5.8798	-2.4701	**0.0232**		-13.6094	-2.6486	**0.0158**
SIZE	+		0.9245	0.4955	0.6260		1.2809	0.8456	0.4083		2.5509	1.0655	0.3000
EBITDAINT	+	-	-0.3052	-1.4492	0.1636		-0.2940	-0.8863	0.3865		-0.1393	-0.6058	0.5518
MVBV	-		-20.0687	-1.2619	0.2222		-21.3740	-3.5248	**0.0023**		-10.3042	-0.5360	0.5981
GROWTH	+	-	-0.0084	-0.9419	0.3581		-0.0011	-0.1725	0.8649		0.4652	1.6593	0.1135
NTATA	+		0.2169	1.1149	0.2788		0.6701	2.2588	**0.0358**		0.0635	0.2808	0.7819
EBITDATA	+	-	0.2926	1.9444	**0.0668**		-1.9646	-2.2294	**0.0380**		0.3734	1.3743	0.1853
CACL	-		8.8425	4.9065	**0.0001**		4.9478	2.1290	**0.0466**		8.2787	3.0707	**0.0063**
SPP	-		0.5731	1.7826	**0.0906**		0.7541	4.2198	**0.0005**		0.1493	0.3258	0.7482
DIV	+		-2.6117	-0.4781	0.6380		-4.4140	-1.0561	0.3042		-9.3860	-1.2394	0.2303
GLOBAL	+		2.6412	0.4367	0.6673		4.3314	0.9999	0.3299		-3.5613	-0.4012	0.6927
R^2			0.5455				0.6383				0.3355		
F-stat			4.2737				5.8120				2.3770		
Jarque-Bera	stat		0.6154				1.3836				0.5751		
	Prob		0.7351				0.5007				0.7501		
White	F-stat		2.2314	*Corrected for			1.0605				1.7720		
	Prob		0.0962	heteroskedasticity			0.4826				0.1767		
Ramsey	F-stat		0.7763				0.9617				1.1928		
	Prob		0.3899				0.3398				0.2892		

	Table 7												
							Dependent Variable TCLTA						
				2006-2009				**2006-2007**				**2008-2009**	
Variable	Expected Sign		coeff	t-stat	Prob		coeff	t-stat	Prob		coeff	t-stat	Prob
Intercept			79.9098	2.9846	**0.0076**		58.6303	1.8655	**0.0776**		92.3000	2.4378	**0.0248**
ALTMANSZ	+	-	-4.0161	-2.1033	**0.0490**		-6.3046	-3.5306	**0.0022**		-6.4018	-1.6592	0.1135
SIZE	+		-3.1362	-2.7917	**0.0116**		-1.9109	-1.6816	0.1090		-4.3548	-2.4224	**0.0256**
EBITDAINT	+	-	-0.0694	-0.2968	0.7698		0.6678	2.6831	**0.0147**		0.1090	0.6315	0.5352
MVBV	-		27.1683	3.8438	**0.0011**		22.6964	4.9895	**0.0001**		25.6654	1.7781	**0.0914**
GROWTH	+	-	0.0145	1.5597	0.1353		0.0097	2.0326	**0.0563**		-0.4873	-2.3148	**0.0320**
NTATA	+		-0.2020	-1.4921	0.1521		-0.3329	-1.4960	0.1511		-0.0647	-0.3806	0.7077
EBITDATA	+	-	0.3790	2.2446	**0.0369**		0.9076	1.3729	0.1858		0.5655	2.7718	**0.0121**
CACL	-		-7.6341	-4.6337	**0.0002**		-3.7724	-2.1639	**0.0434**		-7.3240	-3.6177	**0.0018**
SPP	-		-0.4529	-2.0292	**0.0567**		-0.4399	-3.2816	**0.0039**		-0.4914	-1.4280	0.1695
DIV	+		2.7627	0.7795	0.4453		4.8746	1.5547	0.1365		5.2679	0.9264	0.3659
GLOBAL	+		-1.0284	-0.2565	0.8003		-3.0462	-0.9374	0.3603		0.7951	0.1193	0.9063
R^2			0.7236				0.7653				0.5244		
F-stat			8.1372				9.8948				4.0075		
Jarque-Bera	stat		0.4518				0.2477				0.0620		
	Prob		0.7978				0.8835				0.9695		
White	F-stat		1.6142				1.1366				1.9841		
	Prob		0.2200				0.4338				0.1326		
Ramsey	F-stat		47.4313				9.7288				28.0241		
	Prob		0.0000				0.0059				0.0000		

The relationship between medium to long term leverage and Altmans Z-score (ALTMANSZ) is highly significant and negative across all time periods. The larger coefficient post GFC suggests that the following scenario is plausible. Z-scores, profitability and security prices dropped substantially post GFC, whilst A-REITs were expected to maintain their investments and to take advantage of further opportunities. Market timing theory suggests that managers prefer to issue equity when share prices are high. Given the state of post GFC equity value depression and fear of unit holder dilution, the only feasible options for raising funds would be to either use retained earnings or to take up debt. Given that profitability was negative in most of our sample, the lack of retained earnings leaves borrowing, according to Pecking order theory, as the least costly option to fund expansion. In actual fact, smaller firms followed this path as they were generally not able to attract equity when urgency to reduce gearing was high. Altmans Z score has a highly significant negative impact on long term debt in all time periods, as well as on short term debt over the entire sample and especially prior to the GFC.

A-REIT size (SIZE) has a negative impact on leverage but is only significant at the 10% level over the whole period. This is in contrast to previous findings by Wiwattanakantang (1999), Booth et al (2001), Pandey (2001), Prasad et al (2003), Chikolwa (2009), and Deesomsak et al (2004). It is also in contrast to both Pecking order and static trade off theories (Rajan and Zingales 1995; Fama and French 2002, Feng et al 2007, and Ang et al 1982) where larger entities have a lower probability of bankruptcy and can borrow at lower cost. However, size can also be a proxy for the quantity of information that managers have to convey to the market (Morri and Berretta 2008). The degree of insignificance may be explained by the fact that larger A-REITs which choose to retain earnings do so because it is more beneficial for them to pay tax and to also take advantage of negative profitability tax offsets by using cheaper internal funds. Smaller entities also pay relatively more than large entities to issue new equity (Morri and Berretta 2008). This is a possible explanation of the negative relationship seen. Another possibility is the uptake of relationship lending amongst smaller entities, whereby lenders also rely on provision of 'soft' information. This is particularly important given the riskier environment caused by the GFC. Size has a positive but insignificant effect on long term debt across all sample periods. The positive nature of the relationship supports the theory that large firms have a lower risk of bankruptcy, which lowers their cost of debt. This insignificance highlights Rajan and Zingales' (1995) conclusion that empirically, size has an ambiguous effect on leverage in general. Size has a negative impact on short term debt finance and is significant at the 5% level over the entire period, and also post GFC. This is most likely due to the fact that the ten largest A-REITs reduced gearing by an average of 12% in 2009 (BDO 2010). Another explanation is that equity and long term debt are relatively expensive for smaller entities to issue as opposed to short term borrowing (Morri and Berretta 2008), and this is evidenced by the smallest ten entities increasing gearing by an average of 21% in 2009 (BDO 2010). Their increase in gearing also suggests that these smaller A-REITs were unable to efficiently raise sufficient equity capital.

We also see a larger negative coefficient post GFC which may explain that smaller A-REITs are more likely to undertake cheaper short term debt during unstable periods, where short term debt rollovers help reduce the risk of insolvency.

Interest coverage (EBITDAINT) is found to be slightly insignificant over the 2006-2009 and pre GFC periods, and highly insignificant post GFC. We see a positive relationship pre GFC and a negative one post GFC. A positive relationship is plausible if debt has been issued in times of high profitability where the growth rate of EBITDA is larger than the growth rate of interest repayments. This is again a typical result for entities that choose to pay their earnings out. This relationship is equally as plausible if the rate of decline of EBITDA is larger than the decline in interest payments due to debt reduction. The negative relationship post GFC could indicate that tax-paying A-REITs reduce debt levels and retain any earnings during a recovery in conservative preparation for future economic instability. Interest coverage was positively significant at the 2% level when regressed on short term debt pre GFC. We again believe that as interest coverage increases, A-REITs have a higher propensity to take on more short term debt and maintaining a less risky approach by engaging in more frequent short term debt turnover.

Growth opportunities (MVBV) have a positive insignificant relationship with gearing levels over all periods, which is consistent with the results of Deesomsak (2004). This finding contrasts with the findings of Chikolwa (2009). It also does not support Agency theory where managers may seek inefficient projects to invest in, and do not wish to expose themselves to further monitoring. However, the results do support Pecking order theory whereby growth is mainly funded by retained earnings, and managers prefer to attain further capital by issuing debt rather than equity. When regressed on short term debt, growth opportunities in all time periods are significant and positive, supporting Giambona's (2008) findings. This is logical from a taxation and risk minimisation perspective whereby increased short term debt obligations are more frequently turned over to take advantage of growth opportunities where earnings are paid out. It also helps to avoid underinvestment issues. When regressed on long term debt, the relationship is negative and significant at the 5% level pre GFC. It is likely that A-REITs are in fact funding many of their opportunities with short term funds at the expense of longer term debt, creating an apparent trade-off. There is however a lack of clear evidence with this variable distinguishing between pre and post GFC.

Growth in assets (GROWTH) has a positive and significant relationship with total gearing at the 10% level pre GFC. This may indicate that in stable economic conditions, A-REITs prefer to fund asset expansion with debt. This may be a result of the relatively cheap cost of debt in a stable economy. It also supports Pecking order theory for the same reason as is given in the paragraph above. It demonstrates that A-REITs which do not plan to retain earnings in order to take advantage of tax rules, intend to use cheaper alternative debt financing. Growth has a positive and significant relationship at the 10% level with short term debt pre

GFC. However, post GFC, the relationship becomes negative and is significant at the 5% level. This finding is manifested by the greater issue of equity over this time period. Growth's impact on long term leverage post GFC is slightly insignificant at the 10% level but it does show a positive impact, indicating again that different longevities of debt are substitutes for one another.

The relationship between total leverage and tangibility (NTATA) is highly insignificant across all periods, which is consistent with Wiwattanakantang (1999), but in contrast with Prasad et al (2003) and Suto (2003) who find a positive significant relationship for Malaysian entities, Deesomsak et al (2004), who find a positive relationship among Australian firms and Booth et al (2001) who find a negative relationship for Thai firms. A reason for this could be that, as explained earlier, there is greater use of relationship management within lending, and thus a diminished need for collateral, particularly from smaller A-REITs. There is no significant relationship on short term debt, which is expected as these are not typically secured. Tangibility however, impacts positively and significantly at 5% on long term debt pre GFC. Long term debt is usually used to fund larger asset purchases over a longer time, and thus incorporates a duration premium within its cost. Part of this premium may well address lenders' demand for collateral. This pre GFC period result also coincides with a greater number of long term property purchases and an increase in long term gearing at the height of the economic cycle. This activity abruptly ended after the onset of the GFC.

The effect of profitability (EBITDATA) on total leverage is positive and highly significant at the 1% level over the whole period and again post GFC. It is also positive and significant at 5% relative to short term debt over the whole period and post GFC. This finding is consistent with Rajan and Zingales (1995), Booth et al (2001), Zoppa and McMahon (2002), Cassar and Holmes (2003), Westgaard (2008), and Hammes and Chen (2004). It also substantiates the fact that some of the highest returns in 2009 were achieved by A-REITs with relatively high gearing (BDO 2010). Our result contrasts with Pecking order theory where use of retained earnings derived from higher profitability is preferred to debt. We again claim that A-REIT specific tax rules contribute to an entity's preference to issue debt ahead of using retained earnings. The effect of profitability is also positive and significant at the 10% level on long term debt over the whole period but its effect is negative at the 5% level pre GFC. This again indicates a possible substitution to short term debt, given that its effect is positive in the same period, albeit slightly insignificant. As with Deesomsak (2004), our study includes a greater number of firm-specific variables, overcoming possible omitted variables issues in the previous international literature.

The effect of liquidity (CACL) on total leverage is highly insignificant across all time periods in contrast to Deesomsak (2004). This can be interpreted to suggest that A-REITs do not prefer to fund investments with liquid assets ahead of debt, as postulated by the Pecking order theory. This is consistent with A-REITs' high earnings payout ratios. The effect of liquidity on long term debt is positive and highly significant across all time periods whereas its effect on

short term debt is negative and highly significant. It is plausible to argue in this case that excess liquidity is used to arrest short term debt with greater urgency in larger firms. It also implies that by forfeiting liquid assets, holding longer term assets is more value-enhancing.

The effect of Share price performance (SPP) on both total and long term leverage appears to be positive and significant at the 5% level just prior to the GFC. Our result contrasts with that of Deesomsak (2004). This result contrasts with Market timing theory by suggesting that higher unit prices elicit greater use of debt. Our explanation is that despite the potential to raise sizeable amounts of equity capital when unit prices are high, debt was relatively inexpensive pre GFC and on average, there prevailed an overriding desire to not dilute the unit holder base. Another explanation is that despite tremendous falls in market capitalisation, a large number of A-REITs were actively raising capital to improve their financial position (BDO 2010). In contrast, share price performance affects short term leverage negatively and significantly over the whole period and pre GFC. This supports Market timing theory and could indicate that short term debt was relatively more costly before the onset of the GFC and was substituted for long term debt in order to make long term property purchases. It would be helpful to ask the question "what factors have led to unit price rises pre GFC". If part of the answer is improvement of efficiency in handling short term debt, then our assertion above would be plausible.

The relationship between industry diversification (DIV), global operations (GLOBAL) and total leverage is found to be highly insignificant across all time periods in contrast to Ooi (1999), Giambona (2008), and Chikolwa (2009). It appears that the benefits of diversification and risks of international investment nullify each other in this case. It is however worthy to mention that despite the insignificant impact of expansion to global investment, a positive relationship with longer term debt pre GFC and a negative relationship post GFC does appear to exist. This indicates the possibility of greater long term debt premiums imposed on A-REITs investing more in countries affected by the GFC.

5. Conclusions

The Australian listed property sector is an unique market in its own right, and given the conflicting determinants of capital structure in numerous previous research, the GFC has created an environment where the determinants seem to become even more focused on a specific positive outcome. The effects of a tax ruling exempting A-REITS from paying corporate tax if they pay out at least 90% of their earnings is a large factor differentiating the theoretical predictions across A-REITs and the usual corporate entity. Our results have been interpreted in light of this criterion.

Our results show that several explanatory variables have differing impacts, depending on whether leverage is either long or short term. The GFC also plays a part in affecting capital structure decisions. Cost differences between long and short term debt appear to have caused a major substitution of one for another in the presence of growth opportunities, growth in assets, interest coverage, and size variables. Post GFC, the uptake of short term debt appears to be a strategy used by smaller firms for two reasons. Firstly, more frequent short term debt rollover reduces repayment and insolvency risk, especially since smaller firms had little choice in terms of financing and found it difficult to attract equity. Secondly, equity was difficult or expensive to obtain.

Asset tangibility appears to only be significant and positive for long term debt prior to the GFC. Post GFC, the attempt to issue equity reduces the importance of tangibility with respect to providers of debt finance and reverses the relationship that growth in assets has on leverage. More specifically, for larger A-REITs, the GFC helps to elicit more long term and less short term borrowing relative to each other when purchasing assets. The effect of profitability on long term leverage is negative pre GFC whilst it is positive on short term debt post GFC, again showing a propensity by smaller A-REITs to supplement equity issues with a more frequent debt turnover as the recovery sets in. However when liquidity is high, reducing short term debt appears to be a priority across the entire sample period. The increasing share price performance pre GFC at the peak of the economic cycle elicits greater use of long term debt and less use of short term debt. This strongly suggests that the cost of long term debt was less prohibitive and was used to fund long term assets according to the matching principle, along with avoiding unit holder dilution as a priority. Diversification and global operations appear to have no significant impact on debt levels in general. This result is surprising. However, our study does not gauge the degree of either variable, which means that they may be significant in reality given their exposure to greater diversification, and certain countries that have been affected to a greater extent by the financial crisis. There is no doubt that certain variables affect long and short term leverage in different ways and that financial shocks tend to alter strategies with great urgency. There is also greater scope for more research in this area, particularly with U.S REITs, as the GFC has had the largest impact there. This should provide more dramatic differences across different periods. Generally, as the A-REIT sector attempts to ride out the effects of the GFC, we expect a more passive investment strategy, with less active investment in property development and a more simple financial structure to appeal to more risk averse equity holders. Hopefully, lessons have been learned and the listed property sector will in future position itself with a sustainable mix of long and short term leverage at every stage in the economic cycle.

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