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Foreign Exchange Rate and Capital Structure Decision: A Study of New Zealand Listed Property Trusts

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Abstract

The existing literature on REIT capital-structure decisions implicitly excludes either interest payment tax shield benefits or a trust's growth potential. This paper tests the long-term debt leverage decisions of listed property trusts, but without excluding interest payment tax shield benefits and growth potential. A new variable, the exchange rate is included in the tests, because financial products subject to globalization, such as SWAPs are currently used to support the funding of small economies. This paper uses a truncation regression and probit model to empirically test two competing hypotheses, the trade-off theory and the pecking order theory. It also takes into account the implicit debt costs influenced by the exchange rate. The data for New Zealand listed property trusts (LPTs) are used. Unlike the existing literature, this study finds that the trade-off theory is supported, while the pecking order theory is rejected, when New Zealand LPTs are studied. The additional variable of the 1-year forward appreciation rate of the New Zealand dollar against the US dollar is found to have a significant negative relationship with changes in the long-term debt ratio. This suggests that LPTs tend to reduce long-term debt when the market signals a possible appreciation of the New Zealand dollar. This paper identifies the need to explicitly take into account both tax-shield benefits and growth potential when testing competing hypotheses on capital structure decisions. It also recommends including the exchange rate in the capital structure determinants test, especially when companies or trusts in a small economy are studied.

Keywords: Capital Structure, Exchange Rate, Listed Property Trusts (LPTs), REITs

1. Introduction

Capital structure theories have been widely documented and tested empirically in literature since the seminal work of Modigliani and Miller (1958). Capital structure determinants for Real Estate Investment Trusts (REITs) and listed property companies have been investigated empirically (Maris and Elayan, 1990; Ooi, 2000; Brown and Riddough, 2003; Casey, *et al.* 2006; Giambona, 2008; Morri and Beretta, 2008; Morri and Cristanziani 2009; Boudry *et al.*, 2010; Ooi, *et al.* 2010). Investor reactions to REIT security issuance have also been tested (Brounen and Eichholtz, 2001). Evidence shows that UK listed property companies, European and U.S. REIT capital structure decisions are consistent with the predictions of the trade-off theory (Ooi, 1999; Morri and Cristanziani, 2009; Boudry *et al.*, 2010). U.S. and European REITs are also likely to conform to the pecking order theory (Morri and Beretta, 2008; Morri and Cristanziani, 2009).

The trade-off theory predicts that the optimal capital structure is determined by the trade-off between the interest payment tax shield benefits and the cost of financial distress (Myers, 2001). A company with a large marginal tax rate is likely to borrow more than one with a low marginal tax rate. A company with a high cost of financial distress is likely to borrow less than one with a low such cost. For investment vehicles which are tax exempt, such as REITs, the trade-off theory is not applicable, due to the lack of tax shield benefits. It appears that REITs determine their capital structure in accordance with the pecking order theory.

However, the pecking order theory applies primarily to high growth companies (Myers, 2001). REITs are not high growth securities, because of the minimum 90 percent dividend payout requirement. The improvements and new developments in the REITs portfolio are limited, in comparison with ordinary listed companies. It is therefore worthwhile to

investigate whether the trade-off theory or rather the pecking order theory dominates an investment vehicle that has a similar property investment trust entity to that of REITs; notwithstanding the fact that it does not exclude tax payments and growth potential. This investment vehicle does indeed exist in Australasia and is known as a listed property trust (LPT).

The two competing hypotheses of the *trade-off theory* and the *pecking order theory* can be tested using LPTs, because the interest payment tax shield benefits and growth potential are not excluded. This makes LPTs a more suitable sample than REITs for examining the capital structure decisions without predetermined constraints. This research uses LPTs in New Zealand to test the two competing hypotheses, for the following three reasons. Firstly, around 48% LPTs in Australia (also known as A-REITs) included in the A-REIT 200 index in 2008 are stapled with a property management or development company (source: Property Investment Research, IRESS Market Technologies Ltd and Morningstar (Aspect Huntley) FinAnalysis). Stapled LPTs allow for property development and fund management in what are essentially non-property investment activities (Newell and Sieracki 2010). This results in more risky entities than unstapled trusts (Greer and Parker, 2005). An optimal separation of a pure LPT from a stapled ordinary company in the test seems difficult to achieve. However, without such a separation, a study of stapled LPT capital structure becomes complicated. In equilibrium, the capital structure decisions of large stapled LPTs influence the capital structure decisions of unstapled LPTs. Therefore, it will be much more complicated to examine the LPT capital structure decisions using Australian data than New Zealand data. Consequently, LPTs in New Zealand are chosen as the sample for this study.

Secondly, New Zealand is a small economy with a low population and limited domestic and foreign investments. The economies of scale for debt issuance may not be as prominent in this market as in such large ones as the U.S.A. or Europe. Firm size is used as a proxy for the economies of scale in these large markets (Morri and Cristanziani 2009). In a small economy like New Zealand, irm size is more likely to reflect the asset liquidation risk than economies of scale in debt issuance, due to the limited investments. This study examines how firm size can be used as a proxy for asset liquidation, and how the cost of financial distress is reflected in the liquidity of the LPT portfolios.

In addition, both the New Zealand reserve bank's financial system and practical use of New Zealand LPTs imply the importance of the exchange rate, especially for New Zealand dollars against U.S. dollars, on capital structure decisions. New Zealand relies on the foreign capital market to reduce debt costs by means of the cross-currency and interest rate SWAPs. The exchange rate plays an important role in the SWAPs. The fluctuation of the foreign current exchange rate changes the supply of offshore funds. The change in supply becomes the implicit debt cost. The risk of bankruptcy increases or decreases, according to the decrease or increase in debt costs. It appears necessary to take the exchange rate into account in testing the competing hypotheses of capital structure theories.

Overall, New Zealand LPTs constitute a unique sample for examining capital structure decisions, so that the research contributes the following new perspectives to the literature. Firstly, the research on LPTs, taking into account tax payments and growth potential, yields additional insights into the theories explaining the capital structure decisions for companies or portfolios holding a significant amount of tangible real assets. These new insights cannot be explained by the existing theory on REITs. Secondly, unlike the existing literature, long-

term debt other than total debt is used. Total debt includes short-term debt. Much short term debt is unsecured and will be "rolled over" as long as the fund is available in Australia (Rowland, 2010). Furthermore, this unsecured short-term debt is generally at lower interest rates than long-term debt. The risk and cost of financial distress is not as prominent for short-term debt as long-term debt. The investigation of long-term debt decisions further highlights the importance of the risk and cost of financial distress in the trade-off theory. Last but not least, with globalization, the cost of capital is seldom a domestic issue, especially for a small economy. The investigation of the exchange rate as a new variable in the capital structure decision, will enhance investor knowledge of capital structure theories in the context of recently prevailing financial products under globalization.

It is expected that the long-term debt decisions of LPTs will exhibit different determinants from the capital structure determinants of REITs. The underlying theory predicting LPT capital structure decisions may be different from the prevailing theory predicting REIT capital structure decisions. The remainder of the paper is structured as follows. After a review of the literature on capital structure theories, a brief overview of the New Zealand offshore fund raising system is provided. The data and methodology are then considered, followed by a discussion of results. Additional implications and suggestions on further research are provided in the conclusion.

2. Literature Review on Capital Structure Theories

2.1 The Trade-off Theory and Liquidity for Financial Distress Cost

Without taking into account interest tax shield benefits, Modigliani and Miller (1958) propose that a firm's value does not matter with respect to capital structure in a perfect world. They reconsidered the importance of capital structure on a firm's value when the interest tax

shield adds additional value to a firm with debt (Modigliani and Miller, 1963). If borrowing reduces a firm's corporate tax payments, its optimal financial leverage strategy will be to borrow as much as possible in order to maximize the interest tax shield benefits. In a hypothetical world without the risk and cost of financial distress, the optimal leverage will be 100 percent. However, such an optimal surely will not prevail in the real world. A firm considers the risk and cost of financial distress in the context of borrowing. The risk and cost of financial distress increases when the financial leverage increases. The increase in financial leverage has two opposing effects on a firm's value. It adds value to a firm through the additional interest tax shield benefits, but also reduces the value of a firm by increasing the required rate of return to shareholders through the increase in risk and cost of financial distress.

The trade-off theory predicts that the optimal capital structure is obtained when the marginal interest tax shield benefits are just offset by the marginal cost of financial distress (Myers, 2001). Boudry, *et al.* (2010) find that U.S. REITs were less likely to issue debt over the period from 1997 to 2006, when the expected bankruptcy rate was high. They argue that this finding supports the trade-off theory, because of the negative relationship between debt issuance and expected bankruptcy cost. However, the argument in favour of supporting the trade-off theory using REITs may not be strong , because REITs are exempt from corporate taxation. Corporate tax payments are a basic assumption of the trade-off theory.

Morri and Cristanziani (2009) explicitly compare the capital structure decisions of 60 non-REIT companies and 37 REITs over the years from 2002 to 2006. The findings partially support the trade-off theory that non-REIT companies have significantly higher leverage than REITs. This confirms the importance of corporate tax status in capital structure decisions.

Interest payment tax shield benefit is one of the two essential factors in the trade-off theory. The other crucial factor is the cost of financial distress, which can be represented by the level of liquidity of properties of a listed property company or trust. The liquidity of properties can be signified by the lease maturity, foreclosure recovery rate and property sector ranking (Giambona, *et al.*, 2008). However, the lease maturity of a REIT seems more like a proxy of the cash flow volatility in the near future, than a proxy of the liquidation value of the properties in question. Giambona et al.'s findings from the two-stage least squares suggest that lease maturity may signal the cash flow volatility, because the variable *Volatility* becomes insignificant when the *Lease Maturity* is added into the model. *Volatility* is a significant variable in the traditional controlling model and that using the foreclosure recovery index as a proxy for the liquidation value.

In terms of the foreclosure recovery rate, it is possible to study its relationship with capital structure for the U.S. property market, because Standard and Poor's provides detailed information on the recovery rates of property loans. However, it seems prohibitively difficult to test this relationship for the markets, including New Zealand, in which such information about foreclosure recovery rates is not available.

Giambona, *et al.* (2008) examine the impact of property sectors on capital structure using U.S. REIT sample from 1997 to 2003. They use property sector rankings as a proxy for the level of liquidity of properties in the REIT portfolios. Following White and Gray's (1996) and Geltner and Miller's (2001) studies, Giambona *et al.* (2008) assign high liquidity to industrial properties and low liquidity to retail and office properties, because the former have the most physical structure flexibility and the latter, a modest to low physical structure flexibility.

They find that REITs with office properties have significantly low leverage than REITs concentrating on other sectors. This suggests that a low level of property liquidity implies low financial leverage, because of the expected high cost of financial distress. Their findings partially support the trade-off theory as well.

However, existing studies on property companies or trusts supporting the trade-off theory either ignore the tax-exemption status or exclude the cost of financial distress. It is necessary to take into account both tax-exemption and the cost of financial distress when the two competing hypotheses are examined, in order to enhance the knowledge on capital structure decisions. This present research incorporates both the effects of interest rate tax shield benefits and the cost of financial distress. The hypotheses are tested without the constraints referred to above in the sample.

2.2 The Pecking Order Theory

The motivation behind the pecking order theory is the observed low debt ratios for highly profitable companies with low credit risk (Wald, 1999; Graham, 2000). The trade-off theory does not explain the negative correlation between profitability and debt ratios (Myers, 2001). However, the pecking order theory explains the phenomenon that highly profitable companies have a low debt ratio. In order to avoid information asymmetry between a manager and investors, the priority of resource funding is ranked as follows: (1) Internal finance through retained earnings; (2) the use of debt before issuing equity shares, if external finance is needed; (3) issuing equity if the above two options do not meet the capital requirements. Thus, a company's capital structure reflects its cumulative capital requirements for external financing (Myers, 2001).

According to the pecking order theory, highly profitable companies tend to use retained earnings as internal finance for expansion or for research and development. This resolves the contradictory evidence on the predictions of the trade-off theory. Morri and Beretta's (2008) study on REITs supports the pecking order theory that more profitable REITs tend to borrow less. In the context of the mixed findings with respect to both the trade-off and the pecking order theory, Morri and Cristanziani (2009) study both non-REITs and REITs and find similar supporting evidence to Morri and Beretta's (2008), that more profitable companies have less financial leverage.

However, it cannot be concluded that REITs follows the pecking order theory for capital structure decisions based on the above evidence. REITs have limited expansion opportunities, because 90 percent of earnings have to be distributed to unit holders as dividends. The fundamental assumption of the pecking order theory is that a company requires additional financial resources for growth. REITs are not growth stocks and investors rely on dividend yield more than on capital appreciation in terms of the restrictive dividend payout policy. The statement that REITs operate according to the pecking order theory with respect to capital resources is somewhat questionable.

It is necessary to test the pecking order theory in the context of indirect property investment, using another investment vehicle that is not constrained by the restrictive dividend payout policy. The capital structure decisions of REITs seem less related to the trade-off theory or the pecking order theory in the mainstream financial literature. REITs are generally considered to be categorized as a dividend yield based and real asset backed investment vehicle. Thus, the capital structure issue for REITs needs further examination, taking into account these characteristics.

2.3 The Market Timing Theory

Managers generally have better information than outside investors. Managers can choose the optimal time to issue debt or shares, according to the floatation cost and price in the capital market (Baker and Wurgler, 2002; Baker, *et al.* 2003). Managers are likely to issue equity shares, when they believe that the share price significantly exceeds its value (Baker and Wurgler, 2000). Casey, *et al.* (2006) find that REIT debt level is influenced by such market factors as the price-to-book ratio, price-to-cash-flow and percentage of institutional ownership. REITs with high price-to-book ratios tend to borrow more than those with low price-to-book ratios. The price-to-cash-flow and the percentage of institutional ownership correlate negatively with the debt level. Boudry *et al.* (2010) find strong evidence to support the market timing theory in their study of U.S. REIT debt and equity issuance over the period 1997-2006.

Using a larger sample of U.S. REITs over a shorter time period than Boudry *et al.*'s (2010) study, Ooi, *et al.* (2010) find that market timing is significant for an increase or decrease in REIT leverage. They find that a REIT tends to issue stock when the stock market performance is good (bullish) or REIT stock performance is good. The risk-premium, in terms of the debt holding period, is also found to be positively related to stock issuance, suggesting that REITs are likely to issue equity stock when investors demand a high premium for long-term debt investment.

Overall, market timing seems to explain REITs capital structure decisions more effectively, because, unlike the trade-off and the pecking order theories, it is not based on predetermined corporate tax and company growth assumptions. However, market timing for equity issuance

is not applicable in a small economy, in which the number of transactions in the equity market is extremely low. For example, the number of daily transactions for LPTs in New Zealand can be as low as below two digits. In such an inactive equity market, the market timing of debt costs may be more important than equity performance, regarding the capital structure decisions of LPTs.

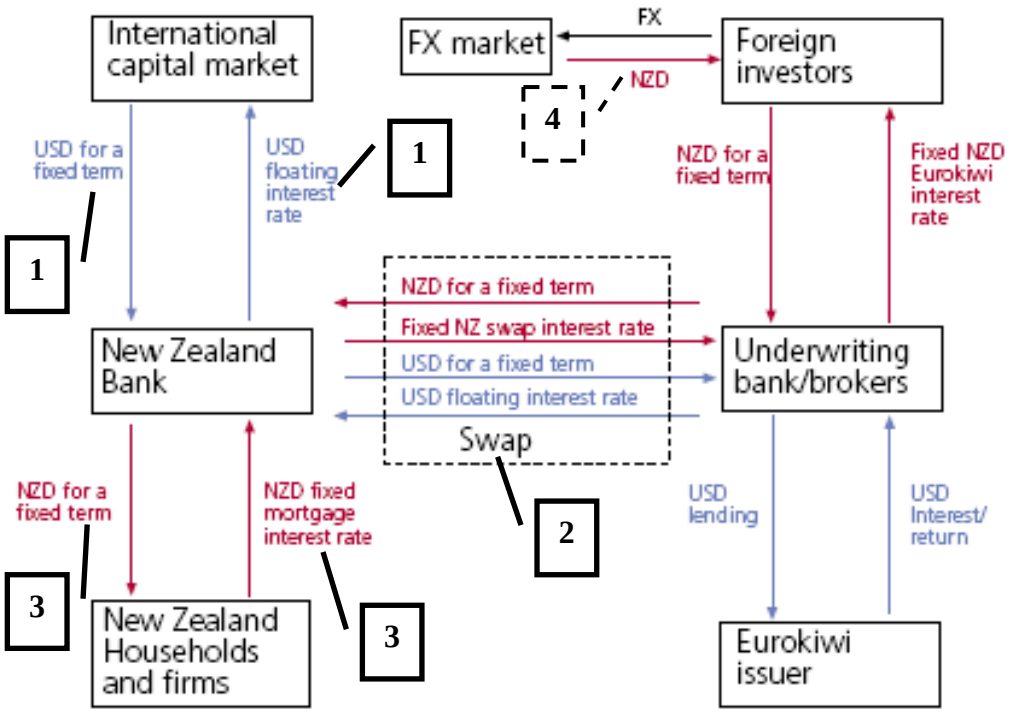
In a small economy like New Zealand, where the interest rate is known to be higher than in other, larger markets, there are plenty of offshore investments denominated in New Zealand dollars. This enables New Zealand banks to reap profits through investments denominated in other currencies at a lower cost. When bank lending activities heavily rely on offshore capital, the exchange rate needs to be taken into account with respect to debt costs, when market timing is considered. How New Zealand banks fund local firms with offshore capital is addressed in the following section. The manner in which exchange rate risk is ultimately borne by the borrowing firms is also discussed.

3. The New Zealand Offshore Capital Resource

As long as the interest rate for New Zealand dollars exceeds the interest rate of foreign currencies in Japan or Europe, investors in these markets will invest in products denominated in New Zealand dollars (Reserve Bank of New Zealand, 1998). New Zealand banks receive New Zealand dollars from offshore capital markets and provide U.S. dollars to offshore capital markets as an exchange based on cross-currency interest rate SWAPs. “A SWAP is an agreement between two or more parties to exchange a sequence of cash flows over a period in the future” (Kolb, 2000). Through cross-currency interest rate SWAPs, New Zealand banks agrees with the other party in a offshore capital market to exchange the principle in New Zealand dollars and U.S. dollars, and the future net interest payments on the currencies. With

this structure, New Zealand banks bear the currency risk of the New Zealand dollar to the U.S. dollar.

Figure I. The Structure of Typical Offshore Fund Raising*



*Source: Reserve Bank of New Zealand (2005)

Figure I depicts the structure of typical offshore fund raising for a New Zealand bank. With Procedure "1", the New Zealand bank raises U.S. dollars in the international capital market and pays the interest at a floating rate for the U.S. dollars. With Procedure "2", the bank swap the U.S. dollars raised in Procedure "1" in exchange for the New Zealand dollars raised from foreign investors who invest in New Zealand dollar bonds. The interest rate SWAPs are also structured together with the currency SWAP. After the bank has raised New Zealand dollars through a bond issue, the bank is able to provide the local borrowers with cheap New Zealand

dollars with Procedure "3". The profit margin for the New Zealand bank derives from the difference between interest paid and interest received. The transaction entails two components, one from the interest payments on U.S. dollars and the other from the interest payments on New Zealand dollars. This profit margin helps the bank to provide cheaper capital to local borrowers than if there were no such structured offshore bond issues.

The exchange rate reflects the demand and supply of currencies in the foreign exchange market. When the New Zealand dollar depreciates against the U.S. dollar, the demand for the New Zealand dollar decreases faster than the decrease in demand for the U.S. dollar, as shown by Procedure "4". The depreciation of the New Zealand dollar signals the increased supply in the SWAPs market shown by Procedure "2". The New Zealand bank is willing to lower the local effective borrowing cost when the supply of New Zealand dollars increases. This happens particularly when the local lending market is highly competitive. The local borrowers, including LPTs, are willing to take out more long-term debt, than if the borrowing cost was not reduced. Thus, it is expected that LPTs are likely to increase their long-term debt to total assets ratio, when the New Zealand dollar depreciates against the U.S. dollar and vice versa. Therefore, the exchange rate is expected to have a negative relationship with the 'long-term debt to total assets ratio'. This relationship is inferred, rather than being directly observable.

The following section presents tests on New Zealand LPTs regarding the trade-off theory and the pecking order theory, taking into account the implicit debt costs influenced by the exchange rate.

4. Sample and Methodology

The following refers to the tests of the two competing hypothesis. Market timing, with implicit debt costs influenced by the exchange rate, are taken into account. As in Ooi, *et al.*'s (2010) and Brown and Riddough's (2003) studies, this research has a dynamic framework in considering the time varying change in but not the level of capital structure.

Unlike Giambona *et al.*'s (2008) study on total leverage, the present study examines the long-term debt to total assets ratio. Long-term debt is more appropriate than total leverage for considering the cost of financial distress in the trade-off theory, because the risk is higher for long-term than short-term debt. The cost of financial distress is also high for long-term secured debt. Modifying the idea of Giambona *et al.* (2008), the liquidity of properties in the LPT portfolios is taken into account explicitly through the average individual property value. Giambona *et al.*'s (2008) liquidity measure of different property sectors is not used in this study for the following two reasons. The first is that the flexibility of physical structure for different property types requires a rigorous investigation in the New Zealand market. This is beyond the scope of the present study. The second reason is that, based on a small sample of LPTs, the categorization of LPTs according to their core property types may lose significant degrees of freedom in the test.

4.1 Sample

A sample of LPTs without tax-exemption benefits is required for this study. A sample of 9 New Zealand LPTs is used. Australian LPTs are not included for two reasons. Firstly, they can be stapled. The capital structure decisions for stapled A-REITs would complicate the study and detract from the focus of this research. Secondly, an Australian LPT can enjoy tax-

exemption benefits as long as it distributes 100 percent dividends to the unit holders (Graeme and Sieracki 2010). It would require further investigation of the dividend policy for each Australian LPT, before this test could be conducted. Thus, the study uses information available in the New Zealand market to test the capital structure theories, without excluding tax payment and in the context of real asset backed long-term debt.

The yearly data are collected from *DataStream*. The study period extends from 1995 to 2010. The sample is unbalanced across different LPTs, because the years of initial public offerings for the LPTs are different. The study includes as many observations as possible, because of the small sample from the small economy. The number of observations is 85.

4.2 Methodology

Tests are conducted for the factors influencing changes in the long-term debt to total assets ratio and for the factors influencing the reduction in the long-term debt to total assets ratio. Two different models are used for the tests. One is the truncated regression model, using the pseudo maximum-likelihood estimation. The truncated regression model is used, because the sample consists of observations with positive long-term debt. The observations of zero long-term debt are not included, because they do not signal the proportional change in long-term debt to total assets. The truncated regression model is as below:

$$\textit{Change of Long-term Debt over Total Assets Ratio}_{i,t} = \textit{Constant} + \beta_1 \textit{Change of 1 Year Forward NZD to USD}_{i,t} + \beta_2 \textit{Log(Total Assets)}_{i,t} + \beta_3 \textit{Market to Book}_{i,t} + \beta_4 \textit{Price-earnings Ratio}_{i,t} + \beta_5 \textit{Price Appreciation of the Trust}_{i,t} + \beta_6 \textit{NZ Stock Market Performance}_{i,t} + \beta_7 \textit{Interest Rate Spread}_{i,t} + \beta_8 \textit{Term Structure of Interest Rate}_{i,t} + \varepsilon_{i,t} \quad (1)$$

The significance levels and coefficients explain how changes in the above independent variables impact on changes in long-term debt decisions. Heteroskedasticity is controlled by means of Huber/White standard errors and covariance.

Table I. Expected Signs of Variables

	Trade-off Theory	Pecking Order Theory	Market Timing		
			Debt Cost	Degree of Risk-aversion	Equity Cost
Model 1 *(Dependent Variable: Change of Long-term Debt over Total Assets Ratio)*					
Log (Total Assets)	-				
Price-earnings Ratio		-			
Appreciation of NZD against USD			-		
Appreciation of 1 Year Forward Rate (NZD against USD)			-		
Interest Rate Spread				+	
Term Structure				+	
Market to Book					-
NZ Stock Market Performance					-
Price Appreciation of the Trust					-
Model 2 *(Dependent Variable: Reduction of Long-term Debt over Total Assets Ratio from the Last Period (Yes =1; No = 0))*					
Log (Total Assets)	+				
Price-earnings Ratio		+			
Appreciation of NZD against USD			+		
Appreciation of 1 Year Forward Rate (NZD against USD)			+		
Interest Rate Spread				-	
Term Structure				-	
Market to Book					+
NZ Stock Market Performance					+
Price Appreciation of the Trust					+

The other model is the probit model, formulated as follows:

$$\textit{Reduction of Long-term Debt over Total Assets Ratio from the Last Period (Yes =1; No = 0)}_{i,t} = \textit{Constant} + \beta_1 \textit{Change of 1 Year Forward NZD to USD}_{i,t} + \beta_2 \textit{Log(Total Assets)}_{i,t} + \beta_3 \textit{Market to Book}_{i,t} + \beta_4 \textit{Price-earnings Ratio}_{i,t} + \beta_5 \textit{Price Appreciation of the Trust}_{i,t} + \beta_6 \textit{NZ Stock Market Performance}_{i,t} + \beta_7 \textit{Interest Rate Spread}_{i,t} + \beta_8 \textit{Term Structure of Interest Rate}_{i,t} + \varepsilon_{i,t} \quad (2)$$

The dependent variable in Model (2) is a categorized variable. The probit model is required for this regression. The significance and coefficients explain how changes in the above independent variables impact on the reduction of the long-term debt to total assets ratio. The expected signs of the variables are summarized in Table I.

4.3 Descriptive Statistics

Figure II shows the total asset value of the 9 New Zealand LPTs (NZ LPTs) over the period 1995 to 2010. It is interesting to note that the total asset value of LPTs surged considerably over this period. The total value increased almost 20 times. The general trend is upward going, at an accelerating rate, with a slight slow-down from 2008 and a decline from 2009. The increase in total value is based on upward movements in commercial property value and the new acquisitions and IPOs during the period. Most IPOs were launched after 1998.

Figure III shows the average total assets over the period for each LPT. The largest LPT is the *Kiwi Income Property Trust*. Its average total asset value is above NZD 1 billion. It was launched in 1993, which was earlier than the most of others' IPOs. The second largest LPT is *AMP Office NZ*. It has average total assets around NZD 900 million and is an office-based property portfolio. The smallest LPT is *CDL Investments NZ*, which was the oldest LPT in

New Zealand, but its development activities are squeezing its capacity to holding large numbers of properties. It is only 6% as large as the *Kiwi Income Property Trust*.

Figure II. Total Assets (NZD '000) of New Zealand LPTs (1995-2010)

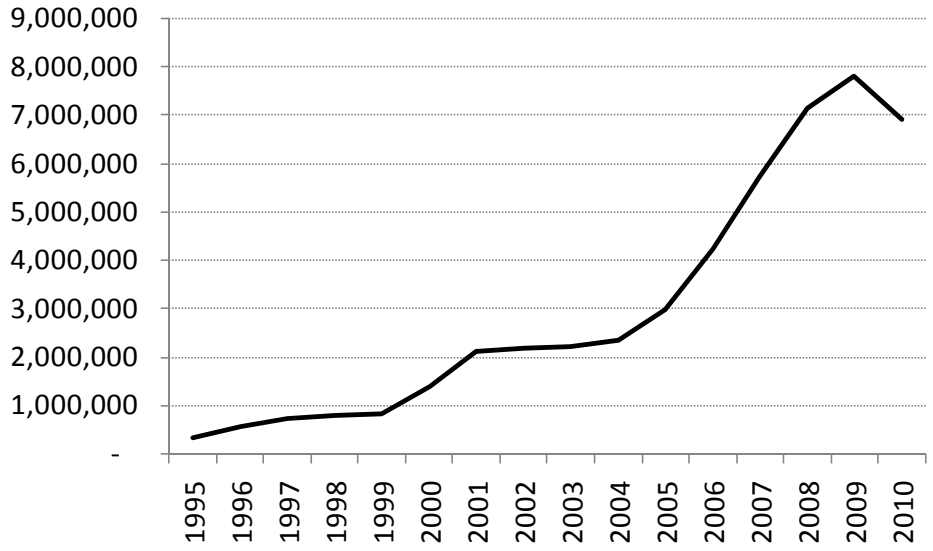
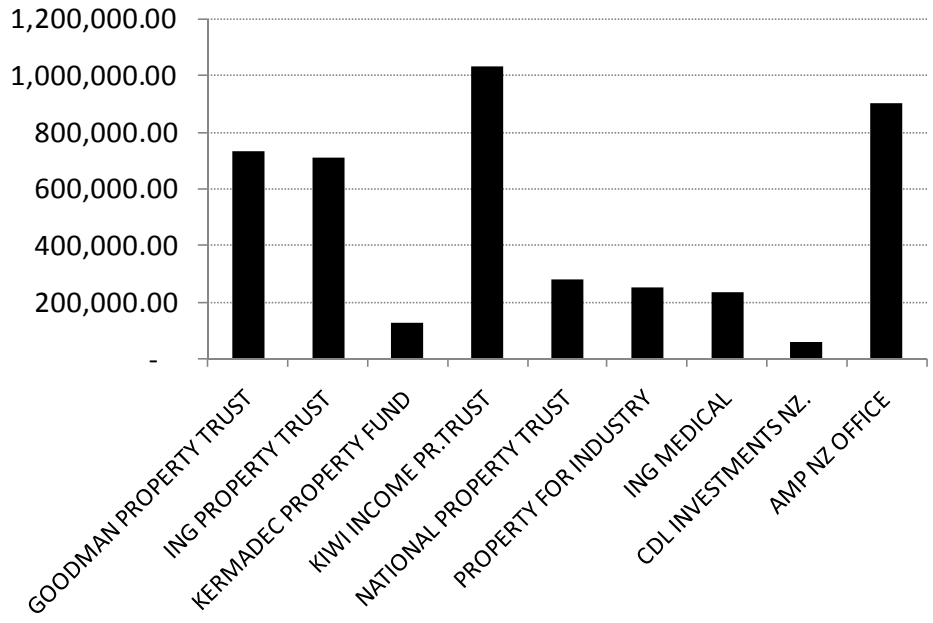


Figure III. Average Total Assets (NZD '000) of Individual NZ LPT (1995-2010)



Liquidity can be represented by the average individual property value for each LPT, because the larger the property value, the more difficult it is to liquidate it in the market, due to financial constraints. Figure IV shows a strong positive correlation between the average individual property value and average total assets of the LPTs. The correlation is as high as 0.8 and the fitted regression line confirms the positive correlation. It can be inferred from the fitted line, that the average individual property value has almost tripled from NZD 20 million to NZD 60 million, when the average total assets of the portfolio doubles from NZD 400 million to NZD 800 million. This strong positive correlation provides a good foundation for using the time varied total asset value to signal the average individual property value of an LPT. Therefore, the total assets will be a proxy of asset liquidity in the test. It is expected to be negatively correlated with the long-term debt increase and positively correlated with the long-term debt decrease.

Figure IV. The relationship between Average Individual Property Value and Average Total Assets for NZ LPTs

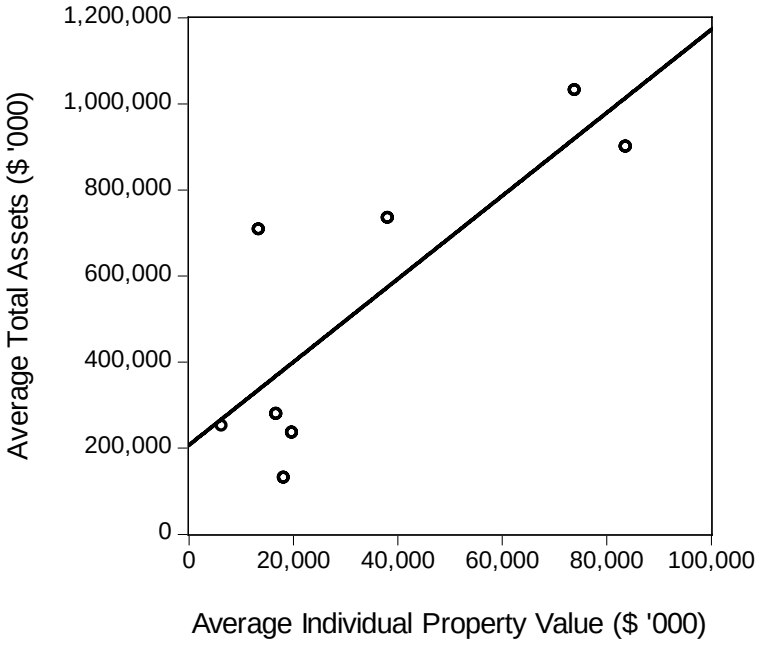


Figure V. Average Long-term Debt to Total Assets Ratio for Individual NZ LPTs (1995-2010)

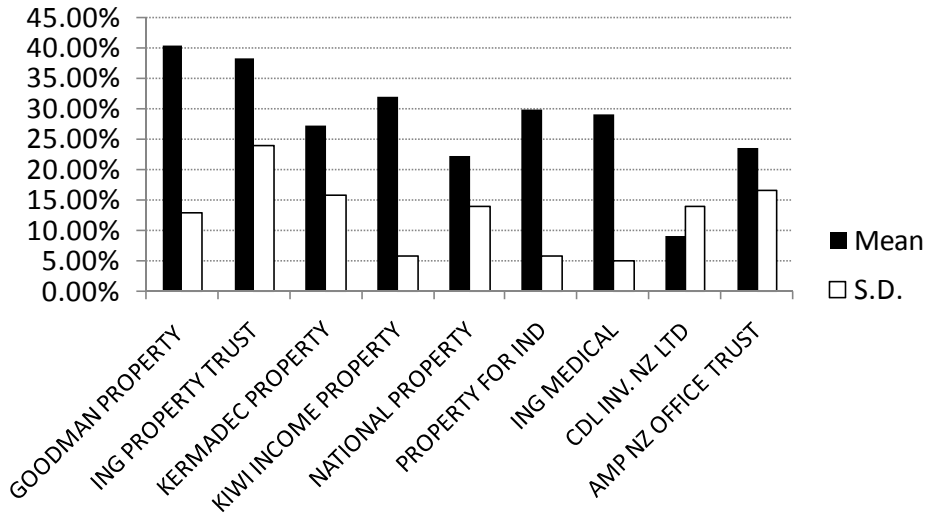


Figure V provides the average long-term debt to total assets ratio for each LPT over the study period. It shows that the average long-term debt gearing ranges from 9% to 40%. The *Goodman Property* and *ING Property Trust* (was renamed the *Argosy Property Trust* on 1 October 2010) have among the highest long-term debt gearing, that is, above 35%. Overall, NZ LPTs have modest long-term debt gearing.

The descriptive statistics for the sample are provided in Table II. The slightly negative change in the median of the variable long-term leverage implies that slightly more than half of the observations decreased the long-term leverage. The 0.533 mean of the long-term leverage decrease dummy also confirms this and suggests that the sample experiences both an increase and a decrease in long-term leverage across the 9 LPTs over the study period. The largest increase in long-term leverage is about 50% within a year, an enormous increase in long-term debt. The largest decrease in long-term leverage is about 66%, which resulted from long-term debt repayment. The large proportion of long-term debt repayment and the

approximately zero median may contribute to the left-skewed distribution for the change in long-term leverage.

Table II. Sample Characteristics

	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis
Change in Long-term Leverage	0.04%	-0.33%	49.20%	-65.66%	19.29%	-44.19%	518.47%
Long-term Leverage Decrease (Dummy Variable)	0.533	1.000	1.000	0.000	0.503	-0.134	1.018
Logarithm of Total Assets ('000)	12.753	12.726	14.499	10.501	0.989	-0.411	2.481
Market to Book	0.897	0.885	1.700	0.460	0.216	1.084	6.261
Price-earning Ratio	11.623	11.350	52.100	1.600	7.207	3.047	17.854
Price Appreciation of the Trust	-0.47%	4.37%	42.74%	-75.77%	19.30%	-124.18%	586.87%
Term Structure	-0.05%	-0.15%	1.54%	-1.04%	0.75%	63.67%	262.15%
NZ Stock Market Performance	-1.35%	5.08%	17.28%	-43.79%	19.24%	-116.09%	292.44%
Interest Rate Spread	0.74%	0.50%	1.72%	-0.08%	0.54%	60.54%	209.61%
Appreciation of 1 Year Forward Rate (NZD against USD)	1.63%	3.71%	22.48%	-25.27%	12.88%	-34.06%	241.03%
Appreciation of NZD against USD	1.99%	5.06%	20.20%	-27.85%	11.71%	-65.32%	320.05%

It's interesting to note that most LPTs are sold at a discount to their book value, as signalled by the 0.885 median and the positive skewness. The largest discount can be as low as 49% of the book value and may result from an inactive equity market. This could suggest that investors in a market with a low number of transactions require a larger return than investors in a market with active transactions. The price-earnings ratio has a moderate mean of 11.6. A large number of observations cluster around the median of 11.4, as shown by the high kurtosis of 17.9.

Most of the observations reflect the positive price appreciation over the study period, as shown by the 4.37% median price appreciation of the trust and the negative skewness, -123.18%. Fluctuations in price appreciation can be very large. The largest growth in price is

42.74% and the largest drop -75.77%. Both of the great fluctuations in price were experienced by *CDL Investments New Zealand Ltd*, confirming that investors in investment and development companies are taking on more risk than those investing in trusts holding properties.

The term structure of interest rate is measured by the 10-year government bond yield minus the 1-year government bond yield. This variable represents the risk premium of debt cost over different time horizons. The seemingly peculiar negative mean and median of the variable signal that the long-term risk premium can be lower than the short-term one. This occurs when long-term investor confidence is shaken. There are two periods with consecutive years experiencing the negative term structure. The first is from 1995 to 1998 and the second from 2004 to 2008. It is worth noting that both periods follow three consecutive years of GDP growth.

The interest rate spread is the 1-year interbank interest rate minus the 1-year government bond yield. This signals the risk-premium of investors regarding debt issuers with different credit ratings. The larger the spread , the more risk-averse the investors are in the market. The median interest rate spread is at a moderate level of 0.5%, which could suggest that investors have a moderate level of risk tolerance.

The New Zealand dollar generally appreciated against the U.S. dollar over the study period. This is shown by the positive mean and median for the exchange rate and the 1-year forward exchange rate. Although it also experienced depreciations that can be as low as -28%, the average yearly appreciation of New Zealand dollars against the U.S. dollars is around 2%.

5. Results

Tables III to V provide the estimated results from the truncation regression of Model (1). Table III contains the results from the estimation using traditional variables in the capital structure theories. Note that the *Log (Total Assets)* is significantly negatively correlated with the change in long-term debt leverage. This departs from the findings in existing studies of the European market. Using a sample of UK property companies, Ooi (2000) finds that firm size negatively influences equity issuance, implying that firm size is positively correlated with debt issuance, because total assets are financed by either debt or equity. Morri and Cristanziani (2009) also find a positive relationship between leverage and company size, using both European REIT and non-REIT data. They regard the positive relationship as the result of economies of scale for debt issuance.

For an economy as small as New Zealand, the economies of scale for debt issuance are insignificant. The significant negative relationship between *Log (Total Assets)* and the change in long-term debt leverage suggest that a New Zealand LPT is likely to increase long-term debt when the properties (assets) in the portfolio become less illiquid. The reason is as follows. *Log (Total Assets)* has high positive correlation with the average individual property value, as shown in Figure IV. The average individual property value signals the liquidity of the LPT portfolio. The smaller the average individual property value, the less liquid the LPT portfolio and *vice versa*. The less liquidity the LPT portfolio is, the lower the liquidation cost upon foreclosure will be, *vice versa*.

Giambona, *et al.*'s (2008) findings confirm implicitly that firm size can be used as a proxy for liquidity, because, when the firm size is significant and negatively correlated with leverage,

the suggested liquidity proxy, like a debt recovery index, becomes insignificant in determining leverage. The other liquidity proxy becomes significant when the firm size is insignificant.

Table III. Estimation of Model (1) with Traditional Variables

	Coefficient		Std. Error	z-Statistic	Prob.
Constant	0.030		0.126	0.239	0.811
Log (Total Assets)	-2.3×10^{-6}	***	0.000	-9.141	0.000
Market to Book	-0.113		0.151	-0.749	0.454
Price-Earnings Ratio	0.006	***	0.001	4.098	0.000
Price Appreciation of the Trust	0.131		0.195	0.669	0.503
NZ Stock Market Performance	-0.090		0.133	-0.677	0.498
Term Structure	0.167		3.122	0.053	0.957
Interest Rate Spread	0.820		2.731	0.300	0.764
Log likelihood	23.572				

*** 1% Significance Level; ** 5% Significance Level; *10% Significance Level.

Overall, the above discussion describes the positive relationship between total assets and the cost of financial distress in the small New Zealand economy. Therefore, the significant negative coefficient of *Log (Total Assets)* confirms the negative correlation between the cost of financial distress and long-term debt leverage. This finding supports the trade-off theory.

The other significant variable in Table III is the *price-earnings ratio*. Ooi, *et al.* (2010) include this variable in a market timing test for U.S. REIT debt and equity issuance. With respect to yearly frequency, it is arguable that the *Price-earnings Ratio* more accurately represents market timing than the profitability of earnings regeneration. At equilibrium, the *Price-earnings Ratio* signals the growth efficiency based on available earnings. A high *Price-earnings Ratio* represents efficient earnings regeneration that contributes to growth. By contrast, a low *Price-earnings Ratio* represents less efficient earnings regeneration that also

contributes to growth. The efficient earnings regeneration yields more internal financial resources than the less efficient earnings regeneration.

According to the pecking order theory, less debt will be used when there are more internal resources, than when there are less internal resources. Thus, a significant negative coefficient of the *Price-earnings Ratio* is expected under the pecking order theory, as suggested by the studies on profitability and capital structure (Morri and Beretta, 2008; Morri and Cristanziani, 2009). However, the coefficient is found to be significantly positive in this present study. Thus, the pecking order theory should be rejected for New Zealand LPTs.

The other variable, *Market to Book*, which measures growth potential, is insignificant. This is the same as Morri and Cristanziani's (2009) finding and different from those of Morri and Beretta's (2008). Morri and Beretta (2008) conduct a study on U.S. REITs and find a positive relationship between growth potential and leverage. The insignificant constant means that the long-term debt leverage does not necessarily change when the variables in the model remain constant.

Table IV reports the estimation results when the variable for the appreciation rate of the New Zealand dollar against U.S. dollar is included in the test under Model (1). The variable *Log (Appreciation of NZD against USD)* is found to be insignificant. However, the 1-year forward appreciation rate has a significant negative correlation with the long-term debt leverage change, as shown by Table V. The significant negative impact of *Appreciation of 1 Year Forward Rate (NZD against USD)* suggests that New Zealand LPTs are likely to reduce long-term debt when the market signals a potential appreciation of New Zealand dollar against the U.S. dollar in near future. This is because the 1-year forward appreciation rate predicts that

the supply of New Zealand dollars from the offshore capital market through the cross-currency interest rate SWAPs may be tightened in the near future. New Zealand banks have to increase in local effective borrowing cost when the supply of the New Zealand dollar is likely to be tightened. The increase in the effective borrowing cost makes long-term debt less attractive than when the effective borrowing cost decline or remain constant. When the New Zealand dollar 1-year forward appreciate rate increases by 10%, an LPT is likely to reduce the long-term debt to total assets ratio by 4.4%. When the New Zealand dollar appreciation rate doubles, an LPT tends to reduce the long-term debt to total assets ratio by 44%. It is surprising that the forward information of currency appreciation can result in such a significant change in long-term debt.

Table IV. Estimation of Model (1) with Appreciation of NZD against USD

	Coefficient		Std. Error	z-Statistic	Prob.
Constant	-0.001		0.138	-0.011	0.992
Appreciation of NZD against USD	-0.349		0.307	-1.137	0.255
Log (Total Assets)	-2.2×10^{-6}	***	0.000	-8.844	0.000
Market to Book	-0.104		0.156	-0.669	0.504
Price-Earnings Ratio	0.006	***	0.001	4.301	0.000
Price Appreciation of the Trust	0.067		0.213	0.316	0.752
NZ Stock Market Performance	0.117		0.214	0.546	0.585
Term Structure	2.559		3.887	0.658	0.510
Interest Rate Spread	5.130		3.955	1.297	0.195
Log likelihood	24.122				

*** 1% Significance Level; ** 5% Significance Level; *10% Significance Level.

The above explains the logic underlying the negative correlation between the 1-year forward appreciation rate of the New Zealand dollar against the U.S. dollar and the long-term debt leverage. Comparing the log likelihood reported in Tables III to V, it is worth noting that the test including the 1-year forward appreciation rate provides the largest log likelihood of the

three truncation regressions. This suggests that incorporating the 1-year forward appreciation rate does improve the model specification.

Table V. Estimation of Model (1) with Appreciation of NZD against USD 1-year forward Rate

	Coefficient		Std. Error	z-Statistic	Prob.
Constant	-0.011		0.153	-0.073	0.942
Appreciation of 1 Year Forward Rate (NZD against USD)	-0.444	**	0.219	-2.032	0.042
Log (Total Assets)	-2.2×10^{-6}	***	0.000	-8.644	0.000
Market to Book	-0.085		0.174	-0.486	0.627
Price-Earnings Ratio	0.006	***	0.001	4.301	0.000
Price Appreciation of the Trust	0.066		0.215	0.309	0.757
NZ Stock Market Performance	0.187		0.197	0.946	0.344
Term Structure	2.251		3.685	0.611	0.541
Interest Rate Spread	4.394		2.768	1.587	0.113
Log likelihood	25.282				

*** 1% Significance Level; ** 5% Significance Level; *10% Significance Level.

Table VI. Estimation of Model (2) with Traditional Variables

	Coefficient	Std. Error	z-Statistic	Prob.
Constant	-1.152	3.249	-0.355	0.723
Log (Total Assets)	0.073	0.229	0.319	0.750
Market to Book	1.018	0.950	1.071	0.284
Price-Earnings Ratio	-0.037	0.023	-1.602	0.109
Price Appreciation of the Trust	-0.451	1.387	-0.325	0.745
NZ Stock Market Performance	-0.613	1.358	-0.452	0.652
Term Structure	11.495	25.637	0.448	0.654
Interest Rate Spread	-25.681	41.981	-0.612	0.541
McFadden R-squared	0.072			
Akaike info criterion	1.549			

*** 1% Significance Level; ** 5% Significance Level; *10% Significance Level.

Tables VI to VIII report the significance and coefficients from the probit test of Model (2). The dependent variable is the dummy of long-term debt *reduction* and Table VI presents the estimates using traditional variables. The findings are insignificant. Tables 6 and 7 report the findings when the New Zealand dollar appreciation rate and the 1-year forward New Zealand dollar appreciation rate are included. The New Zealand dollar appreciation rate and the 1-year forward appreciation rate are positively correlated with long-term debt reduction. This means that an LPT tends to reduce long-term debt, when either the New Zealand dollar appreciates or is likely to appreciate in the near future. This is consistent with the findings from Model (1). The appreciation of the New Zealand dollar reduces the offshore currency supply. This ultimately entails further costs to borrowers. The 10% increase in the New Zealand dollar appreciation rate increases the probability of long-term debt reduction by 60%. The 10% increase of 1-year forward New Zealand dollar appreciation rate will increase about 50% probability of long-term debt reduction.

The *Log (Total Assets)* is significant in the test of Model (2), when the 1-year forward New Zealand dollar appreciation rate is included. The significant positive correlation is consistent with the findings of Model (1), that when the holding properties' liquidity declines, the long-term debt leverage is likely to decline as well. This again confirms the trade-off theory. Similarly, the significant negative correlation between the *Pricing-earnings Ratio* and the long-term debt reduction does not confirm the pecking order theory, because the LPTs that are more efficiently generating earnings are likely to increase their long-term debt. This contrasts with the predictions of the pecking order theory.

Table VII. Estimation of Model (2) with Appreciation of NZD against USD

	Coefficient		Std. Error	z-Statistic	Prob.
Constant	0.237		0.877	0.271	0.787
Appreciation of NZD against USD	6.061	**	3.091	1.961	0.050
Log (Total Assets)	3.6×10^{-5}		0.000	0.224	0.823
Market to Book	0.985		0.809	1.218	0.223
Price-Earnings Ratio	-0.044	*	0.024	-1.820	0.069
Price Appreciation of the Trust	0.887		1.557	0.570	0.569
NZ Stock Market Performance	-4.532	*	2.400	-1.888	0.059
Term Structure	-30.685		34.352	-0.893	0.372
Interest Rate Spread	-99.320	*	57.275	-1.734	0.083
McFadden R-squared	0.118				
Akaike info criterion	1.518				

*** 1% Significance Level; ** 5% Significance Level; *10% Significance Level.

Interest Rate Spread is found to exert a significant negative impact on the long-term debt reduction, suggesting that LPTs are less likely to retire long-term debt when investors become more risk-averse, than when they become less risk-averse. The findings on the influence of *NZ Stock Market Performance* are puzzling. The significant negative relationship between the variable and the long-term debt reduction suggests that LPTs are likely to increase long-term debt when the New Zealand stock market performs better, than when the New Zealand stock market performs more poorly. The market timing theory predicts that REITs will issue equity when the stock market performs well, as in the empirical findings of Ooi, *et al.* (2010). The contrasting finding from this present Research may imply that the market timing theory does not apply to New Zealand, because the stock exchange has such a low volume of activities. In such a situation, the market timing theory is more applicable to debt costs than equity costs, as implied by the significance of *Appreciation of 1 Year Forward Rate* and *Appreciation of NZD against USD*.

Table VIII. Estimation of Model (2) with Appreciation of NZD against USD 1-year forward Rate

	Coefficient		Std. Error	z-Statistic	Prob.
Constant	0.030		0.866	0.035	0.972
Appreciation of 1 Year Forward Rate (NZD against USD)	5.109	***	2.239	2.282	0.023
Log (Total Assets)	3.1×10^{-5}	***	0.000	3.990	0.000
Market to Book	0.992		0.814	1.219	0.223
Price-Earnings Ratio	-0.045	*	0.025	-1.814	0.070
Price Appreciation of the Trust	0.507		1.468	0.345	0.730
NZ Stock Market Performance	-4.059	**	2.025	-2.005	0.045
Term Structure	-10.315		27.114	-0.380	0.704
Interest Rate Spread	-64.540		42.963	-1.502	0.133
McFadden R-squared	0.131				
Akaike info criterion	1.500				

*** 1% Significance Level; ** 5% Significance Level; *10% Significance Level.

Comparing the McFadden R-squared and the Akaike Info Criterion reported in Tables VI to VIII, reveals that the tests including the New Zealand dollar appreciation information are superior to those with only the traditional variables. Comparing the findings from Models (1) and (2), it is consistently reported that the tests including the 1-year forward New Zealand dollar appreciation rate are better than those using traditional variables or including the New Zealand dollar appreciation rate. This suggests that investors and LPTs take into account information on the forward exchange rate.

Overall, the above results confirm the trade-off theory and reject the pecking order theory for New Zealand LPT long-term leverage change. In addition, information on forward exchange rate is an indispensible variable in the capital structure empirical test, especially for a small economy with offshore fund-raising activities.

6. Conclusion

This study tests the competing capital structure theories on LPT long-term leverage changes in a small economy, namely New Zealand. Unlike the findings for REITs, where the pecking order theory is supported, New Zealand LPTs are found to follow the predictions of the trade-off theory. Empirical tests reject the application of the pecking order theory to New Zealand LPTs. The market timing theory, which considers equity market performance, is also rejected. This is because the New Zealand equity market has an extremely low number of transactions. The market timing of implicit debt cost is supported. The 1-year forward New Zealand dollar appreciation rate has a significant negative impact on long-term debt leverage. This is because of the active offshore fund raising system designed to support domestic borrowers.

The findings suggest that, when tax-exemption benefits are excluded for listed property trusts, the trade-off theory dominates the pecking order theory in capital structure decisions. This is different from the findings in the literature about REIT capital structure, where the pecking order theory is supported. This study also indicates that the trade-off theory does not apply to tax-exempted REITs, because the predetermined assumption of the trade-off theory is its interest payment tax shield benefits. Tax-exempted REITs do not have an interest payment tax shield.

The findings imply that the capital structure decision will no longer be a solely domestic issue, when a variety of cross-border financial products become available in the wake of globalization. The relative performance between the domestic and foreign markets should,

evidently, be incorporated into tests on capital structure decisions. The proxy for relative performance between two markets can be either the concurrent exchange rate or the forward exchange rate. In a further study, it would be possible to test how rapidly borrowers take the forward exchange rate into account.

In a small economy, the liquidity of holding properties outweighs the economies of scale in determining long-term debt structure. A small economy constrains the scale of debt issuance, such that the economies of scale are no longer applicable. The liquidity of holding properties becomes a significant factor in determining an LPT's capital structure, because of the potential high cost of financial distress in a small economy with a limited number of investors.

The findings of this study provide valuable input to both the theoretical literature and to investors in practice. Firstly, in a small economy, borrowers should examine information on the forward rate about the exchange rate for capital structure decisions, because the available offshore funding system influences the supply of a domestic currency. Secondly, it is necessary to explicitly compare the capital structure determinants of tax-exempted REITs and non-tax-exempted LPTs, because the inclusion or exclusion of tax-exemption benefits influences the determinants significantly. Last but not least, the market timing behaviour of REITs and LPTs seems to differ according to the level of stock market activity. The findings of the study open up other questions too, such as how transaction volume influences a market timing capital raising strategy.

Furthermore, by continuing with the New Zealand case, debt maturity can be incorporated into the tests, as in Giambona (2008). Based on Giambona (2008), the components of the property sectors, which represent different levels of liquidity can be taken into account when

a rigorous logic of correlation between property sectors and liquidity is found. Besides the above, a similar framework to this research can be applied to Singapore and Hong Kong REITs, in order to examine the impact of asset liquidity and exchange rates on capital structure decisions in these two small and open economies. In addition, Australian property funds had borrowed substantial portions of debt from the USA and Europe before the recent global credit crisis (Rowland, 2010). A variety of short and medium loans, bonds and notes were available sourced from investment banks in the USA, Europe and Japan (Viney, 2009). The present study can be extended into a more sophisticated framework to study how exchange rate influences the capital structure decisions of Australian LPTs when the stapled trusts are taken into account.

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