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by Fitriya Fitriya

Submission date: 01-Aug-2019 08:02AM (UTC+0700)
Submission ID: 1156626749
File name: IRJFE_ISSUE_118.pdf (528K)
Word count: 9063
Character count: 50417

International Research Journal of Finance and Economics
ISSN 1450-2887 Issue 124 June, 2014
http://www.internationalresearchjournaloffinanceandeconomics.com

Corporate governance and capital structure: Evidence from New Zealand-listed firms

Fitriya Fauzi
The University of Muhammadiyah Palembang-Indonesia

Abdul Basyith
The University of Muhammadiyah Palembang-Indonesia

Tri Widyastuti
The University of Pancasila-Indonesia

Choiriyah
The University of Muhammadiyah Palembang-Indonesia

Abstract

This paper investigates corporate governance mechanism and capital structure determinants of New Zealand-listed firms. Using a balanced-panel of 79 New Zealand-listed firms, this study employs a balanced panel method using dynamic-panel Instrumental Variable-Generalised Methods of Moments (IV-GMM) for capital structure determinants as it corrects heteroskedasticity and endogeneity problems which might result in an unbiased and inconsistent estimation. Meanwhile, the Generalised Least Square (GLS) is employed in determining the impact of corporate governance mechanism on capital structure. All variables apart from non-debt tax shields and profitability exhibit a significant impact on total debt. Overall, these variables confirm the trade-off theory even though the coefficient for non-debt tax shield confirms the pecking-order theory. While the GLS regression reveals that all corporate governance variables exhibit a significant impact in determining the capital structure.

Key words: corporate governance, capital structure, dynamic-panel IV-GMM, GLS, New Zealand-listed firms

Introduction

In publicly held corporations, the management is usually controlled by non-owner managers. These managers act as agents for the owners, who have hired them to make decisions and to manage the firm for the owners' benefit; that is, to maximize the shareholders' wealth. However, managers also consider their own interests, and the conflict between the goals of the shareholders and those of managers give rise to agency costs. Therefore, corporate governance is necessary to align the interests of shareholders and management.

This conflict of interests has been addressed in a legal way through regulations, such as the Companies Act 1993 in New Zealand (NZ). The Companies Act 1993 is aimed at regulating rules of conduct which firms should comply with, for example: the positions of chief executive and chairman should not be held by the same person; the audit committee should be comprised solely of non-executive directors; there should be a nomination

committee for board appointments with a majority of independent directors; there should be a remuneration committee to recommend remuneration packages for directors, the members of which are identified in the annual report. If these rules of conduct are well implemented, they reduce the risk of agency problems within the company. In addition, the Organisation for Economic Co-operation and Development (2004) states that corporate governance involves a set of relationships between a company's management, its board, its shareholders and other stakeholders. The Organisation for Economic Co-operation and Development (OECD) also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined.

Jensen and Meckling (1976) propose two types of agency costs, which are, the agency cost of equity and the agency cost of debt. Agency cost of equity occurs when firms sell shares to outside investors in which the investor pays less for the shares because they expect the firms' performance to change after they buy the shares, and at the end the equity shares issue reduces the market value of corporate assets. To overcome this problem, firms may use debt, as it forces managers to perform effectively, but this also does not come free of charge. Using debt can create agency costs of debt because sophisticated debt-holders will create bond agreements which are costly to negotiate and to enforce.

To mitigate the agency problems, firms can structure the executive compensation shares packages to align managers' interest with stakeholders' interest. Compensation share contracts give managers incentives to act in the shareholders' best interest, as the shares tie managerial wealth directly to the firm's share price. This encourages managers to maximise the stock price, as their own wealth will increase along with that of the other shareholders'. Lee, Lev and Yeo (2008), in their study of agency problems, found that higher pay dispersion, including managerial equity compensation shares, can mitigate agency problems and ultimately improve a firm's performance. The compensation shares method is the most powerful but most expensive method of overcoming agency problems.

Further, the corporate governance function is intended to develop ownership structures and corporate governance structures for companies to ensure managers behave ethically and make decisions that benefit shareholders. Jensen and Meckling, (1976) propose agency theory, which suggests that in many modern organisations there is separation between ownership (principal) and management (agents), and the separation may resulted in agency problems, including excessive consumption and under-investment decisions. Fama and Jensen (1983) suggest that boards reduce agency conflicts by separating management from control aspects of the decision-making process. In the United States, the Sarbanes-Oxley Act was introduced to enhance transparency and control of agency costs through enacting various governance requirements for listed firms.

Boards of directors play an important role in maintaining effective corporate governance, particularly in publicly held corporations in which agency problems may arise from the separation of ownership and control. The management body in a firm is responsible for suggesting and implementing major policies; however, shareholders do not always agree with these policies, which can lead to an agency problem between management and shareholders. The board of directors is only one of several mechanisms that can mitigate agency conflicts within the firm. Capital structure, insider ownership and block ownership are also effective in controlling agency problems. Moreover, in a dynamic environment, boards become very important for the smooth functioning of organisations. Boards are expected to perform different functions. For example, monitoring of management to mitigate agency costs (Eisenhardt, 1989; Roberts, McNulty, & Stiles, 2005; Shleifer & Vishny, 1997), hiring and firing of management (Hermalin & Weisbach, 1998), providing and giving access to resources (Hendry & Kiel, 2004), and providing strategic direction for the firm (Kemp, 2006). Boards also seek to protect shareholders' interest in a competitive environment while

maintaining managerial accountability to attain good firm performance (Hendry & Kiel, 2004; McIntyre, Murphy, & Mitchell, 2007). Most empirical studies find that board composition is affected not only by those corporate governance mechanisms, but also other variables, including firm size and firm performance. Claessens, Djankov, Fan and Lang (2002) propose that a good corporate governance framework can benefit the firm with easier financing, lower costs of capital, improved stakeholder favour, and overall better company performance.

After the seminal work of Modigliani and Miller (1963), numerous studies have been done to explore to what extent capital structure theory can be applied in to different circumstances. Those studies were conducted under different assumptions which fit in to the situation. Trade-off theory, pecking-order theory, agency-theory and some other theories are empirical evidences that challen Modigliani and Miller' capital structure studies (M&M). Further, the empirical relevance of the trade-off theory, pecking-order theory, agency-theory and some other theory has often been questioned. Some research has been conducted to investigate this theory but the results from various contexts are mixed and inconclusive. The different results may be caused by different firm size, the maturity of the respective capital market, and the country being used as sample.

The impact of firm characteristics on firm's financing choices has been extensively studied across firms and countries, for example, Rajan & Zingales (1995), Arvin & Francis (1999), Frank & Goyal (2003) study of US firms, meanwhile Deesomsak, Paudyal and Pescetto (2004),and De Jong, Kabir and Nguyen (2008) study Asia Pacific firms, and some other developed and developing countries. At an aggregate level, firm leverage is similar across the developed countries, and any differences that exist are not easily explained by institutional differences (Rajan & Zingales, 1995), most firms had a convergence in their capital structure toward industry average (Arvin & Francis, 1999), thus the factors identified by previous cross sectional studies in the United States to be related to leverage seem similarly related in other countries well. However, the findings of those studies seem to be obsolete as now some studies find that the capital structure decision of firms is influenced by the environmen which they operate, as well as firm specific factors identified in the extant literature, the capital structure decisions are not only the product of a firm's own characteristics but also the result of the corporate governance, legal framework and institutional environment of the countries in which the firm operates (Deesomsak, Paudyal and Pescetto, 2004), firm specific determinants of leverage differ ac s countries and there is an indirect impact, beca e country specific factors also influence the roles of firm specific determinants of leverage (De Jong, Kabir and Nguyen, 2008).

The evidence indicates that different theories apply for different circumstances and periods, therefore an investigation of capital structure choices and its determinant continues be an important subject. Apparently, few studies have been conducted to investigate the capital structure choices in New Zealand firms, and therefore it is necessary to conduct ongoing investigation in the pattern of capital structures.

At present there are two common types of financing that can be utilised by New Zealand firms; first, equity financing, and second, debt financing. These two financing have its own advantages compared to one another. Firms may raise equity and debt financing through capital markets, the New Zealand stock exchange (NZX), which was established in 200 The NZX opens more opportunities for New Zealand's firms to access funding sources. The m n financial markets in New Zealand relate to debt instruments, equities, and managed funds. Debt security markets operate at both wholesale and retail levels which vary by type of instrument, issuer, buyer, maturity and level of risk.

According to the Statistics New Zealand (2004), the majority of New Zealand firms' ancing was raised from debt financing, particularly short-term financing. The reasons why short-term financing is preferred over long-term debt financing are, first, New Zealand firms

were dominated by small and medium enterprises, and second, the majority of New Zealand firms were in primary sector, thus give a different characteristic in contributing to its economic growth. Though New Zealand is considered a developed market, NZ's business characteristics differ from those developed countries and thus may result in the different financing choices. Vos and Nyamori (1997) conducted a survey research of New Zealand firms' capital structure, and they found that there were several reasons why firms choose debt as source of financing; a debt carries lower cost, it is more convenient and flexible to deal with, the debt requirement fits with their circumstances, it is a corporate policy to adjust their capital structure, and it is available all the time. Further, recent study by Artemesia and McCulloch (2007) conclude that the cost structure and the net interest margins of New Zealand banks are low, therefore enterprises prefer short-term financing. Moreover, minimising the cost of borrowing is consistent with the pecking-order theory, as confirmed by Boyle & Eckhold (1997) and Wellalage & Locke (2012).

This study investigates two aspects; first, the determinants of capital structure and; second, the impact of the corporate governance mechanism on capital structure.

Literature Review

There has been reasonable consensus among practitioners and academicians about the importance of good corporate governance in the economy. Corporate ownership structure can act as an incentive device for reducing the agency costs associated with the separation of ownership and management can be used to protect property rights of the firm. A large body of literature does confirm the evidence that corporate governance, particularly the role of ownership structure, is crucial in determining the incentive of insiders to expropriate minority shareholder. The impact of corporate governance on the firm value has been extensively studied in recent years. The literature has highlighted the role of ownership structure that has the impact on the firm value. Most of the literature on corporate governance is concentrated in explaining the firm performance and its determinants. Yet, little is known as to how the corporate governance influences firm's financing policies (capital structure).

The paper aims to bridge research gap by providing a direct empirical test of the hypothesis. The hypothesis is that the firms with poor corporate governance mechanisms tend to have higher level of debt than equity in their portfolio and vice-versa. This study is particularly interested in the role of firm's ownership structure with connection to its capital structure. Our main research objective is to test whether there are links between the capital structure and corporate governance. If so, does debt constrain or facilitate entrenchment? The study of the relation between capital structure and corporate governance is advantageous, not only to enrich our understanding about whether or not firms that are vulnerable to expropriation issue more debt to have more resources to use for private interests but also which ownership.

The trade-off theory derived from the models based on taxes and agency cost. Jensen and Meckling (1976) suggest the firm has an optimal capital structure by offsetting the advantages of debt and the cost of debt. Therefore, trade off theory refers to the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. It states that there is an advantage to financing with debt, the tax benefits of debt, and tax benefits to be had, but there is also a cost to financing with debt, the costs of financial distress including bankruptcy costs, and agency costs. This theory suggests that there is a positive relationship between debt level and firm performance. Moreover, the implication of this trade off theory is that firms have target leverage and they adjust their leverage toward the target over time.

Trade off theory has been tested by researchers in developed markets, most focusing on how the determinant factors affect capital structure choice. Graham and Harvey (2001)

survey 392 chief financial officers (CFOs) about the cost of capital, capital budgeting, and capital structure. They find moderate support that firms follow the trade-off theory and pecking order theory, but mixed or little evidence that signalling, transactions costs, underinvestment costs, asset substitution, bargaining with employees, free cash flow considerations and product market concerns affect capital structure choice.

Pecking order theory was developed by Myers and Majluf (1984). Myers and Majluf (1984) consider that firms must issue common stock to raise cash to undertake a valuable investment opportunity. Management is assumed to know more about the firm's value than potential investors and investors sometimes interpret the firm's actions irrationally. An equilibrium model of issue-investment decision has been developed under these assumptions. The model shows that firms may refuse to issue stock, and therefore may pass up valuable investment opportunities. The model suggests explanations for several aspects of corporate financing behaviour, including the tendency to rely on internal sources of funds, and to prefer debt to equity if external financing is required.

Boyle and Eckhold (1997), and Wellalage and Locke (2012) examine capital structure choice in New Zealand, especially the debt choices of NZ's corporate firms. While Boyle and Eckhold (1997) find that most existing theories are of little value in explaining the debt choices of NZ corporate firms, Wellalage and Locke (2012) find that firm-specific characteristics play a significant role in determining firm leverage levels rather than corporate governance variables. In addition, Wellalage and Locke include corporate governance variables (e.g., foreign share ownership, managerial ownership and non-executive directors on the board) in determining capital structure, and find that New Zealand's firms fit into pecking-order theory. Nevertheless, this study sheds some light of New Zealand's capital structure choices and is necessary for the regulators in stimulating the enterprises to be more active in the debt market activities. Overall, the results are remarkably similar to those of Titman and Wessels (1988) and Bennett and Donnelly (1993) for US and UK data, respectively.

Though theoretical and empirical studies have shown that profitability, tangibility, firm size, non-debt tax shields, growth, managerial ownership, and some others factors impact on capital structure (Titman & Wessels, 1988; Harris and Raviv, 1991; Rajan & Zingales, 1995; Shyam-Sunder & Myers, 1999; De Jong, Kabir and Nguyen, 2008; Wellalage & Locke, 2011), this empirical evidence of firms' specific factors are inconclusive as different countries show a different result. In addition, Deesomsak, Paudyal and Pescetto (2004) suggest that capital structure decisions are not only the product of a firm's own characteristics but also the result of the corporate governance, legal framework and institutional environment of the countries in which the firm operates.

Profitability plays a significant role in determining how much debt is utilised by firms. According to trade-off theory, profitable firms tend to utilise more debt compared to unprofitable ones to avoid higher tax payment, but firms also have to offset the benefit of and the risk of utilising debt. In contrast, pecking-order theory suggests that profitable firms tend to utilise less debt compared to unprofitable ones, because profitable firms have more earnings and they prefer to utilise internal financing rather than external financing. Study of Rajan and Zingales (1995) find that profitability is negatively correlated with leverage. Further, the negative influence of profitability on leverage should become stronger as firm size increases.

Most secured-debt requires collateral as it guarantees the bondholders, and tangible assets are likely to have an impact on the borrowing decisions because they are less subject to informational asymmetries, and have a greater value than intangible assets in the case of bankruptcy (Gaud et al., 2005). Thus, the higher the tangible assets proportion, the greater the chance of obtaining debt financing (Harris & Raviv, 1991; Rajan & Zingales, 1995; Gaud et

al., 2005). According to trade-off theory, larger firms with higher assets tangibility tend to have more leverage and pay higher dividend. A dividend payment is one of tacit information that managers convey to the market, thus indicates that firms have higher growth prospect, and referred as a signalling, and it is assumed that signalling has a positive relationship with leverage. Further, some empirical studies suggest that the performance of each firm may differ according to their size, because larger firms have greater economies of scale in the transaction costs associated with long term debt, which may influence the results and inferences (Ramaswamy, 2001; Frank & Goyal, 2003; Coleman, 2007; Jermias, 2008; Ebaid, 2009).

The tax deduction for depreciation and investment tax credits is called non-debt tax shields (NDTS). DeAngelo and Masulis (1980) argue that non-debt tax shields are substitutes for the tax benefits of debt financing, and firms with larger non-debt tax shields have low debt. However, many studies argue that larger firms tend to be more diversified and hence are less likely to go bankrupt, so they tend to utilise debt to have the benefit of tax-shields. Debt usage will reduce the taxable income, and thus firms favour having more debt, as this increase the amount of cash obtained (Bradley et al., 1984). In contrast, the presence of non-debt tax shields reduces the optimal advantage of debt because a higher level of non-debt tax shields result in less reliance on the tax-deductible aspect of debt which leads to a negative relationship with debt.

Empirical studies find that firms with higher growth tend to have more debt as they expect to expand their business scale, and debt financing is considered as a preferable option as it carries lower cost, however, high-growth firms having an outstanding debt with higher opportunities on profitable investments will forgo these investments as it only affects debtholders rather than shareholders, therefore, growth is expected to have negative relationships with debt (Myers, 1977).

Leland & Pyle (1977) and Berger et al (1997) find that leverage is positively correlated with the extent of managerial shareholdings. On the other hand, it is assumed that higher inside ownership tends to have less debt because they prefer to use internal financing to avoid the agency problem with debt holders, therefore negative relationship between leverage and managerial ownership are expected. Friend and Hasbrouck (1988) test director's shareholdings as a determinant of firm capital structure, and they find a significant negative relationship between ownership and debt. Likewise, Wiwattanakantang (1999) find that ownership structure effects financial structure. Further, Seifert and Gonenc (2008) explain that in the US and the UK, ownership is dispersed and managers and insiders have superior information compared to outside shareholders. In Japan and Germany, the asymmetric information issues are caused more due to the quality of information provided to investors and the legal rights afforded to these outside investors. However, empirical studies provide mixed results on how ownership structure impact on capital structure.

A series of specific hypothesis in determining the capital structure choice is provided as follows:

H_1 : Tangibility is positively associated with leverage
H_2 : Non-debt tax shields is negatively associated with leverage
H_3 : Profitability is negatively associated with leverage
H_4 : Growth is negatively associated with leverage
H_5 : Signalling is positively associated with leverage
H_6 : Firm size is positively associated with leverage

Capital structure is one of a crucial to company success, and good corporate governance is one of ways to achieve an optimal capital structure which may benefit firms through greater access to external finance, lower cost of capital and favourable treatment of all stakeholders (Claessens et al., 2002). Several studies have examined the relationship

between corporate governance mechanisms and capital structure across countries with different characteristics, with the majority in the USA, UK and Japan. The studies yielded different results, affected by the nature of the prevailing governance system for each country. Investigating New Zealand's listed firms could add diversity to the growing body of work that examines this relationship.

The corporate governance mechanism investigated in this study includes board size, non-independent director, blockholder ownership and managerial ownership. Further, the composition of board directors on the board is a central issue, as is whether such representation on the board is a factor of good governance, or does this create possible conflicts that would be bad for the company, for example Coles et al. (2008), Wen et al. (2002), Berger et al. (1997) and Abor (2007). Similarly there are issues of whether there is a significant impact of both owner and non-owner managers' presence in the board on capital structure, for example Berger et al. (1997), Baum et al. (2007), Tong and Ning (2004), and Lee (2010).

According to the corporate governance mechanisms and capital structure, the hypothesis is provided as follows:

H_7 : *Managerial ownership is negatively associated with leverage.*
H_8 : *Blockholder ownership is negatively associated with leverage.*
H_9 : *Board size is positively associated with leverage.*
H_{10} : *A non-independent director is positively associated with leverage.*

Research Methodology

This study uses data from the annual reports of New Zealand-listed firms for the period of 2007-2011 collected from NZX deep archive. Those firms with any missing observations for any variable in the model during the research period are dropped, and thus a balanced panel data of 79 New Zealand-listed firms were observed from 147. Though only 79 firms were included, the sample may do well in capturing aggregate leverage in the country because the listed firms can represent the whole industry in New Zealand.

Table 1 presents descriptive statistics for the sample data. The mean value of total debt (Leverage_TD) is 0.45, with a range of 0 to 0.99, suggesting that all firms have leverage close to the average leverage of industry. Further, the mean value for long-term debt (Leverage_LTD) is lower than that short-term debt (Leverage_STD); indicating firms have more short-term debt. Two considerable reasons for utilising more short-term debt are the majority of small & medium enterprises for New Zealand's business, and the majority of agriculture industry's domination. According to Statistics New Zealand (2004), that New Zealand's firms utilised debt rather than equity financing which account for 72% total debt compared to Australian firms which utilised only 25% of debt financing in 2003 (Welch, 2003). In addition, the average total debt utilised by New Zealand's firms account for 45% which is close to the range of the average total debt for most developed countries in 1990s, 50 to 60% (Rajan & Zingales, 1995). Comparing two different periods might be absurd, therefore, based on recent studies by Bessler Drobetz and Gruninger (2011), the average total debt for all firms over the world is 25%, for non-US firms is 26%, for US firms is 23%, for common law countries is 25% and for civil law countries is 27%, it seems now New Zealand's firms utilised debt financing above the average. Further, the mean value for tangibility is 0.44, suggesting the majority of firms are having moderate fixed assets, hence it is useful for raising debt financing by using it as collateral.

Table 2 presents correlation matrix for all variables in the model. The highest correlation is between non-debt tax shields and profitability at 0.79. This suggests that firms with higher level of debt tend to maximise non-debt tax shields resulted in higher profitability

tend to maximise. None of the correlations among explanatory variables are above 0.79, indicating a low likelihood of multicollinearity issues arising in the OLS regressions.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Leverage_TD	395	.4537037	.2642277	0	.99
Leverage_LTD	395	.1985714	.1861882	0	.9
Leverage_STD	395	.8014286	.1861882	.1	1
Tangibility	395	.439709	.3259117	0	1
NDTS	395	4.630362	22.52141	0	261.0197
Profitabil~y	395	5.142678	60.51128	-165.035	833.8715
Growth	395	1.119773	1.344634	-2.77	5.03
Signalling	395	1.002838	20.27491	-100.75	381.11
FirmSize	395	5.336293	1.181901	2.0294	9.7017
BoardSize	395	.7698269	.1248919	0	1.1139
NED	395	.6914179	.1996208	.1667	1
IOWNP	395	.1536694	.2454946	0	.9777
BlockOwnshp	395	.4673162	.3500104	0	.9886
IndDummy_~ry	395	.1518987	.3593779	0	1
IndDummy_E~y	395	.0759494	.2652531	0	1
IndDummy_G~s	395	.1772152	.382335	0	1
IndDummy_~ty	395	.0632911	.2437947	0	1
IndDummy_S~e	395	.4177215	.4938093	0	1
IndDummy_I~t	395	.1012658	.302063	0	1

Table 2: Correlation Matrix

	Leve~_TD	Leve~LTD	Leve~STD	Tangib~y	NDTS	Profit~y	Growth	Signal~g	FirmSize
Leverage_TD	1.0000								
Leverage_LTD	0.4134	1.0000							
Leverage_STD	-0.4134	-1.0000	1.0000						
Tangibility	-0.1619	0.1469	-0.1469	1.0000					
NDTS	-0.1808	-0.1983	0.1983	-0.0077	1.0000				
Profitabil~y	-0.1298	-0.0530	0.0530	-0.0684	0.7904	1.0000			
Growth	0.0008	-0.0341	0.0341	0.0572	-0.0378	-0.0354	1.0000		
Signalling	0.0880	0.1184	-0.1184	-0.0564	-0.0096	-0.0017	0.0837	1.0000	
FirmSize	-0.0850	0.1825	-0.1825	0.2974	0.1739	0.1139	0.1683	-0.0258	1.0000

Table 3: Correlation Matrix

	Leve~_TD	Leve~LTD	Leve~STD	BoardS~e	NED	IOWNP	BlockO~p
Leverage_TD	1.0000						
Leverage_LTD	0.4134	1.0000					
Leverage_STD	-0.4134	-1.0000	1.0000				
BoardSize	0.0462	0.1785	-0.1785	1.0000			
NED	0.0675	0.0260	-0.0260	0.1298	1.0000		
IOWNP	-0.0279	-0.1338	0.1338	-0.2339	-0.2167	1.0000	
BlockOwnshp	0.0874	0.0332	-0.0332	0.0055	-0.1300	0.2448	1.0000

Variables are largely adopted from previous study, thus this study uses three leverage proxies as the dependent variables which are total debt, long-term debt and short term debt. The explanatory variables include tangibility, non-debt tax shields (NDTS), profitability, growth, signalling, managerial ownership and firm size, while industry dummy serves as a control variable Variables

(Titman & Wessels, 1988; Rajan & Zingales, 1995; Shyam-Sunder & Myers, 1999). Similar to the capital structure determinant variables, all the corporate governance variables tend to have low correlation

Variables are defined as follow: leverage is measured as ratio of total debt over total assets; tangibility is measured as ratio of total fixed assets over total assets; non-debt tax shield is measured as ratio of total depreciation over total assets; profitability is measured as ratio of earnings before interest, tax and depreciation over total assets; growth is measured as book to market ratio; signaling is measured as ratio of dividend payment over total assets; managerial ownership is measured as percentage of the inside ownership's equity; firm size is measured as the log of total assets (Titman & Wessels, 1988; Rajan & Zingales, 1995; Shyam-Sunder & Myers, 1999; Gaud et al., 2005; Padron et al., 2005).

This study uses panel data which allows the unobservable heterogeneity for each observation in the sample to be eliminated and multicollinearity among variables to be alleviated. Maddala and Lahiri (2009) specify problems that might be present in the regression model, such as heteroskedasticity, multicollinearity and endogeneity problems. Those problems cause inconsistency of the OLS estimates.

Dang (2005) examines the performance of two influential but contradicting theories of capital structure, known as the trade off and pecking order theory, using a partial adjustment model, and an error correction model as a generalised specification of the partial adjustment process. This framework allows him to nest the cash flow deficit variable necessary to examine the pecking order theory. The empirical models are estimated by the Anderson and Hsiao IV and the Arellano and Bond GMM methods, which are argued to yield consistent estimates for dynamic panel data.

As can be seen in the Table 2 that most cross-correlation for the independent variables are fairly small, thus, giving less cause for concerning about the multicollinearity problem. Further, the Arellano-Bond test for zero autocorrelation in first difference errors results -14.5681 (*p-value 0.1169*) confirming no serial correlation in the original error as desired. The Breusch-Pagan test for heteroskedasticity results 7.43 (*p-value 0.006*) indicating that variances among the explanatory variables are not constant.

To estimate the leverage, this equation is the first point to begin, the model is as follows:

$$y_{it} = \alpha + x'_{it}\beta + \cdots + x'_{in}\beta_n + u_{it} \quad (1)$$

$$= \mu_i + \lambda_t + v_{it} \quad (2)$$

$i = 1, \ldots, N; t = 1, \ldots, T$

where μ_i denotes the unobservable individual effect, λ_t denotes the unobservable time effect, and v_{it} is the remainder stochastic disturbance term.

When using the Ordinary Least Squares (OLS) to estimate β, one assumes that x'_{it} is orthogonal with u_{it} of equation (1), but this may not be true and thus the estimated β may be biased with endogeneity. Therefore, instrumental variable (IV), denotes as z, approach may be used to solve the endogeneity, which the changes in the new IV is associated with changes in x but do not lead to changes in y (except indirectly via x). Therefore, the equation which includes endogeneity is specified as follows (Cameron & Trivedi, 2010);

$$y_{1i} = y'_{2i}\beta_1 + x'_{1i}\beta_2 + \cdots + x'_{ni}\beta_n + u_i, \qquad i = 1, \ldots, N \quad (3)$$

The regression errors u_i are assumed to be uncorrelated with x'_{1i} and x'_{ni} but correlated with y'_{2i}, and this correlation leads to inconsistent estimation. To obtain consistent estimation, a reduced-form model is appropriate;

$$y_i = x'_{1i}\beta_1 + \cdots + x'_{ni}\beta_n + u_i \quad (4)$$

$$e = (u_i|z_i) = 0 \quad (5)$$

Most previous studies on the capital structure determinants treat tangibility, non-debt tax shields, growth and managerial ownership as endogenous variables determinants (Agrawal and Knoeber, 1996; Dessi & Robertson, 2003; Maghyereh, 2005; Coricelli, Driffield, Pal & Roland, 2011), thus the Durbin-Wu-Hausman test for endogeneity is necessary, and the result confirms that tangibility, non-debt tax shields, growth and managerial ownership are indeed endogenous. Therefore, this study employs dynamic-panel IV-GMM (Instrumental Variable-Generalised Methods of Moments) which provides consistent estimates by utilising instruments that obtained from the orthogonality condition between the regressors and the error terms. The analysis includes the Sargan test for over-identification restrictions to test the validity of instruments used in the model which will confirm that the parameters of the model are estimated using optimal GMM.

It is worth mentioning the possibility that some of the regressors may be correlated with the past and current values of the idiosyncratic component of disturbances. The model for dynamic-panel GMM is (Cameron & Trivedi, 2010);

$$y_{it} = \alpha_i + \gamma_1 y_{i,t-1} + \cdots + \gamma_p y_{i,t-p} + x'_{it}\beta + \varepsilon_{it}\,, \qquad t = p+1, \ldots\ldots, T \quad (1)$$

The assumption is that ε_{it} are serially uncorrelated. An important aspect of the dynamic panel estimator is its using the firm's history as instruments for explanatory variables.

The regression model is specified as follows (Titman & Wessels, 1988; Rajan & Zingales, 1995; Shyam-Sunder & Myers, 1999):

$$\boldsymbol{Lev_{it} = \beta_0 + Tang_{it} + NDTS_{it} + Profitability_{it} + Growth_{it} + Signalling_{it} + Ownership_{it} + Firm\,Size_{it} + \varepsilon_{it}} \quad (2)$$

According to the specification test results for normality, heteroskedasticity and endogeneity of the data, the regression method employed to test the relationship between corporate governance mechanism and capital structure is Generalised Least Square method. The GLS is appropriate because the assumption of homoskedasticity of errors fails, and the Ordinary Least Square (OLS) between estimators is appropriate because of the short time period and many observations.

Findings

Table 4, Table 5 and Table 6 present the regression results for total debt, long-term debt and short-term debt, respectively. Each table provides two methods, which is 2SLS and dynamic-GMM. In addition, instrument in the Dynamic-IV GMM is significant in the level of two-lagged for total debt and long-term debt, while for short-term debt the lagged instrument is significant in one-lagged. More specifically, the Wald (joint) test provides evidence that supports the joint significance of all the regressors in the model. Furthermore, the Sargan test confirms the validity of the instruments used. As mentioned in the method part, this study uses dynamic-GMM, but there is no harm if we compare the regression results that confirmed efficient and unbiased estimators.

The coefficients of tangibility, growth, signalling, managerial ownership and firm size are significant for the total debt equation (Table 4; Dynamic-IV GMM, REG.2). It can be concluded that firms' specific factors play a significant impact in explaining New Zealand listed-firms capital structure. The different results were obtained for long-term debt and short-term debt. For long-term debt, only growth coefficient is significant (Table 5; Dynamic-

IV GMM, REG.2), while for short-term debt only coefficients for tangibility, profitability, managerial ownership and firm size are signific (Table 6; Dynamic-IV GMM, REG.1).

The tangibility coefficients for total debt and short-term debt are positive and significant which confirm that higher assets' tangibility associated with higher leverage. This result is supported also by the survey of Statistics New Zealand (2004), that more than 70% New Zealand firms utilise debt financing, particularly short-term debt, in which the majority source of the short-term debt financing are banks. The significant result for tangibility in explaining short-term debt confirms that lateral is of important for banks to secure the debt.

The growth coefficients for total debt and long-term debt are positive and significant which contradict the notion of negative association between growth and leverage. This result indicates that higher growth-firms tend to have more debt as they expect to expand their business scale, and a debt financing is prefe le as it carries lower cost. The result is contradictory w Titman & Wessels (1988), Rajan and Zingales (1995), Harris & Raviv (1991), Ghosh et al. (2000) and Booth et al (2001) which a negative relationship between growth and leverage.

The signalling coefficient is positive and significant for total debt which confirms that larger firms paying hi er dividend tend to have more debt as they want to convey the information to investor about the future prospect of e firm.

The managerial ownership coefficients are positive and s ificant for total debt and short-term debt which confirm that leverage minimise the total agency costs resulting from the conflicts of interest between shareholders and managers, and conflicts b ween shareholders and debtholders (Jensen & Meckling, 1976 & 1986). Further, this resul pport the finding of Leland & Pyle (1977) and Berger et al (1997) studies which find that leverage is positively correlated with the extent of mana ial shareholdings.

The firm siz oefficient for total debt is negative and signifi t while positive and significant for short-term debt. For total debt, the result is in line with Harris & Raviv (1991) and Rajan & Zingales (1995). While, the positive coefficient for short-term debt supports suggest that larger firms with higher assets' tangibility utilise more leverage (short-term debt) to gain the tax benefits of debt as larger firms having less risk of bankruptcy.

Finally, only short-term debt yields negative and significant coefficient for profitability confirming for pecking-order theory. However, this study is unable to generate that pecking-order theory applied to New Zealand listed-firms as the majority of the firms' specific factors support the trade-off theory. Hence, firms' specific factors are of important in explaining New Zealand listed-firms' capital structure. Further research is necessary as the firms' behaviour is changed overtime, using wider scope of sample and periods.

The estimated coefficients for those two models (2SLS and Dynamic-IV GMM) are considerably different. The different re ts are affected by the differencing used for IV, in which simple dynamic panel models suffers from a weak instrument problem when the dynamic panel au regressive coefficient approaches unity as the estimator depends on time span. If time span is small; the estimators are asymptotically random, and if time span is large; the un-weighted GMM estimator may be inconsistent and the efficient two step estimator may be biased. Because of the small time span for this study, the estimated coefficients for Dynamic-IV GMM yield higher estimated coefficients and higher standard errors compared to the rest of the m el. The consistent estimators yielded by dynamic GMM because GMM procedure can use moment conditions based on the level equations together with the sual Arellano and Bond type orthogonality conditions (Blundell & Bond, 1998), and direct maximum likelihood estimation based on the differenced data under assumed normality for the idiosyncratic errors (Hsiao et al., 2002).

Table 4: Summary of four different estimators of total debt equation

Variables	*2SLS*		*Dynamic-IV GMM*	
	REG. 1	*REG. 2*	*REG. 1*	*REG. 2*
L1.			0.0912	0.1065
			(0.1300)	(0.1243)
L2.				-0.7153***
				(0.2346)
Constant	0.6877***	0.6450**	0.3762	1.4958***
	(0.1097)	(0.2822)	(0.4800)	(0.3761)
Tangiblity	-0.2108**	-2740***	-0.6580***	0.3989**
	(0.1001)	(0.1149)	(0.2580)	(0.1910)
NDTS	-0.0016	-0.0017	-0.0020	-0.0003
	(0.0016)	(0.0016)	(0.0032)	(0.0026)
Profitability	-0.0001	-0.0001	-0.0001	0.0001
	(0.0005)	(0.0005)	(0.0010)	-0.0007
Growth	3.62e-07	1.98e-07	-1.57e-07	1.28e-06*
	(3.33e-06)	(3.38e-06)	(8.72e-07)	7.52e-07
Signalling	-0.0005	-0.0005	-0.0001	0.0057***
	(0.0012)	(0.0012)	(0.0003)	(0.0019)
IOWNP	-0.0999	-0.0976	0.1382	-0.9356***
	(0.1107)	(0.1119)	(0.1487)	(0.3198)
Firm Size	-0.0207	-0.0175	0.0636	-0.1543**
	(0.0215)	(0.0232)	(0.0950)	(0.0685)
Industry_Primary		0.0620		
		(0.2478)		
Industry_Energy		0.1171		
		(0.2547)		
Industry_Goods		0.0826		
		(0.2483)		
Industry_Property		-0.0832		
		(0.2616)		
Industry_Service		0.0800		
		(0.2418)		
Industry_Investment		-0.0589		
		(0.2587)		
Groups	78	78	78	75
R-squared	0.0741	0.1069		
Wald-Chi2	18.33	21.09	26.57	70.82
Prob.Chi2	0.0000	0.0712	0.0008	0.0000
Arellano Bond test			-1.5094	-1.5681
Prob.Chi2			0.1312	0.1169
Sargan test			15.3490	13.9363
Prob.Chi2			0.2861	0.3048

*Standard errors in parentheses are for coefficients. *sig. at 10%level, **sig. at 5% level, and ***sig. at 1% level*

Table 5: Summary of four different estimators of total long-term debt equation

Variables	*2SLS*		*Dynamic-IV GMM*	
	REG. 1	*REG. 2*	*REG. 1*	*REG. 2*
L1.			0.0316	-0.0292
			(0.1048)	(0.1051)
L2.				-0.9093***
				(0.2082)
Constant	0.0825	-0.2112	0.1080	0.3829***
	(0.0718)	(0.1826)	(0.4208)	(0.1543)
Tangiblity	0.0534	0.1034	-0.2113	0.1028
	(0.0609)	(0.0685)	(0.2837)	(0.1439)
NDTS	-0.0031***	-0.0031***	0.0014	-0.0004
	(0.0010)	(0.0010)	(0.0030)	(0.0027)
Profitability	0.0009***	0.0010***	0.0002	0.0002
	(0.0003)	(0.0003)	(0.0009)	(0.0007)
Growth	-4.31e-07	-4.20e-07	-1.20e-06***	-8.97e-07***
	(2.40e-06)	(2.40e-06)	(3.72e-07)	(3.20e-07)
Signalling	-0.0007	-0.0007	-0.0001	0.0017
	(0.0010)	(0.0009)	(0.0002)	(0.0018)
IOWNP	-0.0790	-0.0746	0.5537***	0.0300
	(0.0673)	(0.0670)	(0.1530)	(0.2949)
Firm Size	0.0224	0.0185	0.0189)	-0.0122
	(0.0138)	(0.0147)	(0.0893)	(0.0370)
Industry_Primary		0.2822*		
		(0.1591)		
Industry_Energy		0.2958*		
		(0.1628)		
Industry_Goods		0.2913*		
		(0.1595)		
Industry_Property		0.4255***		
		(0.1675)		
Industry_Service		0.2746*		
		(0.1555)		
Industry_Investment		0.3137**		
		(0.1660)		
Groups	78	78	78	75
R-squared	0.14130	0.19480		
Wald-Chi2	17.58	25.76	121.99	488.71
Prob.Chi2	0.0140	0.0183	0.0000	0.0000
Arellano Bond test			-0.4263	-0.0208
Prob.Chi2			0.6699	0.9835
Sargan test			12.5497	22.5939**
Prob.Chi2			0.4832	0.0319

*Standard errors in parentheses are for coefficients. *sig. at 10%level, **sig. at 5% level, and ***sig. at 1% level*

Table 6: Summary of four different estimators of total short-term debt equation

Variables	*2SLS*		*Dynamic-IV GMM*	
	REG. 1	*REG. 2*	*REG. 1*	*REG. 2*
L1.			-0.1800	0.2450*
			(0.1173)	(0.1418)
L2.				0.0574
				(0.1287)
Constant	0.9175***	1.2112***	0.7309***	0.3280
	(0.0718)	(0.1826)	(0.2390)	(0.3045)
Tangiblity	-0.0534	-0.1034	-0.4393***	-0.2917**
	(0.0608)	(0.0685)	(0.1852)	(0.1435)
NDTS	0.0031***	0.0031***	0.0060	0.0055**
	(0.0010)	(0.0010)	(0.0038)	(0.0026)
Profitability	-0.0009***	-0.0010***	-0.0020**	-0.0018***
	(0.0003)	(0.0003)	(0.0010)	(0.0007)
Growth	4.[illegible]-07	4.20e-07	1.11e-07	-2.00e-08
	(2.40e-06)	(2.40e-06	(5.20e-07)	(3.66e-07)
Signalling	0.0007	0.0007	0.0001	-0.0010
	(0.0010)	(0.0010)	(0.0001)	(0.0014)
IOWNP	0.0790	0.0746	-0.5138***	0.0028
	(0.0673)	(0.0670)	(0.1452)	(0.2358)
Firm Size	-0.0224	-0.0185	0.0891**	0.0663
	(0.0138)	(0.0147)	(0.0423)	(0.0442)
Industry_Primary		-0.2822*		
		(0.1591)		
Industry_Energy		-0.2958*		
		(0.1628)		
Industry_Goods		-0.2913*		
		(0.1595)		
Industry_Property		-0.4255***		
		(0.1675)		
Industry_Service		-0.2746*		
		(0.1555)		
Industry_Investment		-0.3137**		
		(0.1660)		
Groups	78	78	78	75
R-squared	0.1413	0.1948		
Wald-Chi2	17.58	25.76	208.14	1223.57
Prob.Chi2	0.0140	0.0183	0.0000	0.0000
Arellano Bond test			0.8324	-0.8725
Prob.Chi2			0.4052	0.3829
Sargan test			13.6350	13.2600
Prob.Chi2			0.4000	0.3504

*Standard errors in parentheses are for coefficients. *sig. at 10%level, **sig. at 5% level, and ***sig. at 1% level*

Table 7: The regression result for corporate governance and capital structure

Variables	*GLS*	
	REG. 1	*REG. 2*
Constant	0.4814***	0.3071***
	(0.0407)	(0.0868)
Board Size	-0.0052***	-0.2540***
	(0.0464)	(0.0457)
Non-Independent Director	0.2106***	0.1145***
	(0.0280)	(0.0347)
Managerial Ownership	-0.1847***	-0.2286***
	(0.0204)	(0.0214)
Blockholder Ownership	0.0302*	0.0533***
	(0.0180)	(0.0175)
Industry_Primary		0.3068***
		(0.0706)
Industry_Energy		0.1478**
		(0.0730)
Industry_Goods		0.2619***
		(0.0703)
Industry_Property		0.2060***
		(0.0728)
Industry_Service		0.2615***
		(0.0698)
Industry_Investment		0.2120***
		(0.0722)
Groups	79	79
Wald-Chi2	203.98	297.98
Prob.Chi2	0.0000	0.0000

*Standard errors in parentheses are for coefficients. *sig. at 10%level, **sig. at 5% level, and ***sig. at 1% level*

Table 4 presents the regression result of corporate governance variables and capital structure. Board size coefficient is a negative and significant, indicating an inverse relationship between board size and capital structure. The results is in contrast with the hypothesis in which the larger the boards the greater the amount of debt. Further, non-independent director coefficient is a positive and significant, suggesting that the more outsiders firm has, the greater the amount of debt firm has. This may be caused that larger outsider provides more choices and access to the borrowing institutions. Managerial ownership coefficient is a negative and significant, suggesting that the more portion share owned by manager, the lower the amount of debt. The reason is that managers tend to avoid the ownership dilution. In contrast, the blockholder ownership coefficient is a positive and significant, suggesting that the more portions owned by institutional investors, the greater the amount of debt. This may be caused that the blockholders are more credible in complying their obligation.

Conclusions

In the last 5 decades, there has been considerable theoretical emphasis on the capital structure determinants as it applies to corporate finance. This paper is an attempt to empirically test for the capital structure determinants in New Zealand context in which this study examines a recent dataset of New Zealand listed-firms. Using dynamic-panel IV GMM, this study demonstrates that controlling for endogeneity and dynamic nature in the capital structure equation slightly increases the estimated coefficients (Table 4.1, Table 4.2 and Table 4.3). Therefore, OLS estimates are upward-biased, but the bias is not large to be concerned. Additionally, this study demonstrates that using valid or non-weak instruments (firms' history in lagged-value), leads to precise estimates of the capital structure determinants. Further, the dynamic analysis of this study shows that capital structure is persistent over time.The dynamic-IV GMM regression reveals that tangibility, growth, signalling, managerial ownership and firm size exhibit a significant impact on total debt. While the GLS regression reveals that all corporate governance variables exhibit a significant impact in determining the capital structure.

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