Capital structure decisions, agency conflicts and corporate performance: Evidence from Sri Lankan listed manufacturing firms

Ratnam Vijayakumaran

Department of Financial Management, University of Jaffna, Jaffna, Sri Lanka.

Abstract

Corporate capital structure decisions are key determinants of firm performance. The agency theory suggests that debt financing is one of the mechanisms to mitigate agency problems and thus to improve firm performance. This paper provides important evidence on the performance effects of capital structure decisions using a panel of listed manufacturing firms in the Colombo Stock Exchange (CSE) over the period 2008-2013. The Generalized Method of Moments (GMM) methodology is used to control for unobserved heterogeneity, endogeneity of capital structure decisions, and their dynamics. The study documents that leverage is non-linearly (U-shaped) related to firm performance.

Keywords : *Capital structure, agency problems, endogeneity, performance, Sri Lanka*

1. Introduction

The seminal work of Modigliani and Miller (1958) which led to the modern theory of capital structure argues that capital structure is *irrelevant* to the value of a firm under perfect capital market conditions. However, in practice, the existence of market imperfections such as taxes, asymmetric information and agency problems makes capital structure decisions relevant to the value of the firms (Modigliani and Miller,1963; Jensen Meckling, 1976; Myers, 1977; Myers and Majluf, 1984). These theories suggest that firms' choices of debt and equity in their capital structure have impacts on firm performance. More specially, Jensen Meckling, (1976) argue that even in the absence of taxes debt capital can have significant effects on corporate performance.

Conflicts of interests between managers and shareholders arising from the separation of ownership and control in corporations create considerable agency costs for the firms and to the economy as a whole (Berle and Means, 1932; Jensen and Meckling, 1976). Yet, several governance mechanisms have been devised to mitigate agency conflicts in the firms. Agency theory suggests that one such mechanism is debt financing. Greater debt financing may provide mangers with the incentives to reduce agency costs through the threat of liquidation, which causes personal losses to managers in terms of salaries, reputation, perquisites, etc. (e.g., Grossman and Hart,1982; Williams, 1987), and through pressure to generate cash flow to pay interest expenses(Jensen, 1986).

By contrast, research argues that in emerging markets including Sri Lanka, the major agency problem is conflict of interests between

majority shareholders/ controlling shareholder and minority shareholders (Faccio et al., 2001; Morck et al., 2005, Senaratne and Gunaratne, 2007). Faccio et al. (2001) further suggest that controlling shareholders of the corporate groups (a dominant form of business in Asia and Europe) may prefer to use more debt capital in the capital structure and thus avail more resources in the firm for the expropriation of minority shareholders without diluting his/her controlling stake or directly assuming more liabilities. Yet, firms in the emerging economies are found to use more short term debt in their financial structure (Booth et al., 2001, Du et al., 2015). This suggests that when levels of leverage increase beyond a certain level, these firms may face high liquidity risk and default risk (Diamond, 1991) and lenders may become vigilant and closely monitor firms behavior (Jensen and Meckling, 1976; Hadlock and James, 2002). Hence, controlling shareholders may reduce their entrenchment behavior and align their interest with those of other shareholders. Taken together, these arguments suggest that levels of leverage may be non-linearly (U-shaped) related to corporate performance in emerging markets.

Unlike in the developed countries, only a few studies have examined the impact of capital structure on firm performance in the context of Sri Lanka. For example, Manawaduge et al., (2011) and Velnamby and Nimalathasan (2013) report a negative relationship between debt financing and performance. However, these studies do not examine potential non-linear relationship between levels of leverage and corporate performance although previous studies show that leverage is non-monotonically related to performance (Margaritis and Psillaki, 2010). Furthermore, although Manawaduge et al. (2011) control for unobserved firm heterogeneity (e.g., management quality) in their regression using fixed effects model, they do not control for potential endogeneity arising from reverse causality (Berger and Bonaccorsi di Patti, 2006) or dynamic endogeneity of debt (Dessi and Robertson, 2003). This study fills this important gap in the literature.

Using a dynamic modelling framework to control for control for firm heterogeneity and endogeneity of capital structure decisions, and their dynamics, we document a strong non-monotonic relationship (U shaped) between levels of leverage and firm performance. This implies that as levels of leverage increases, debt capital is not efficiently utilized in the firm to increase performance; instead, it may be used by controlling shareholders to expropriate corporate resources, which negatively affect firm performance. Yet, after a threshold level is reached, further increase in debt capital helps to improve performance by constraining entrenchment behavior of controlling shareholders through the threat of liquidation and the close monitoring by the lenders.

This paper contributes to the existing literature in several fronts. First, in advancing existing literature, we provide first evidence on the non-linear effects of leverage on corporate performance in the context of emerging economies, specially in Sri Lanka. Previously, only Margaritis and Psillaki, (2010) empirically examine non-monotonic relationship between levels of leverage and performance for French manufacturing firms.

Second, unlike previous studies that have looked at the relationships between capital structure decisions and firm performance based on Sri Lankan financial markets, we use system GMM estimator to control for unobserved firm heterogeneity and endogeneity of capital structure decisions. Finally, in this study, we also take in to account the dynamic relationship between capital structure decisions and firm performance.

The reminder of the paper is organized as follows. Section 2 reviews relevant literature and develops hypotheses. The model specifications and estimation methods are discussed in Section 3. Section 4 describes the data and descriptive statistics. Section 5 discusses empirical results. Section 6 concludes with summary and suggestions for potential avenues for future research.

2. Review of the Literature and hypothesis

2.1. Agency theory, Leverage and firm performance

Agency theory suggests that the separation of ownership and control in corporations and information asymmetries lead to conflicts of interest between managers and outside shareholders as well as those between controlling and minority shareholders (Berle and Means, 1932; Jensen and Meckling, 1976; Shleifer and Vishny, 1986; Morck et al., 2005). For example, managers may exert insufficient work effort, over-consume perquisites, invest in unrelated business to build empires, or otherwise fail to maximize firm value while controlling shareholders may expropriate corporate resources through related party transactions at the expenses of minority shareholders. Thus, agency conflicts and the resultant agency costs represent important issues in corporate governance and capital structure literature.

Agency theory also suggests that the choice of capital structure can act as a disciplinary mechanism in mitigating these agency conflicts and thus contributes to an improvement on firm performance. Greater debt financing may provide mangers with the incentives to reduce agency costs through the threat of liquidation, which causes personal losses to managers of salaries, reputation, perquisites, etc. (e.g., Grossman and Hart,1982; Williams, 1987). Jensen (1986) argues that debt commits managers to disgorge free cash flow, thus it reduces the amount available to managers to over-invest. However, whereas increased leverage may help mitigate the agency costs of outside equity, the opposite effect may occur for the agency costs of outside debt arising from conflicts between debt holders and shareholders. For example, Myers (1977) argues that high levels of debt can lead to under investment (debt overhang) problem due to conflicts between bondholders and stockholders over growth options.

By contrast, research based on emerging markets argues that the major agency problem faced by firms in these countries is conflict of interests between majority shareholders/ controlling shareholder and minority shareholders (Faccio et al., 2001; Morck et al., 2005). Stulz, (1990) and Faccio et al. (2001) suggest that controlling shareholders may encourage the use of more debt capital in the capital structure and thus avail more resources in the firm for their expropriation of minority shareholders without diluting his controlling stakes or directly assuming more liabilities. Faccio et al. (2001) further show that Asian institutions appear ineffective, allowing the controlling share-holders of corporations lower down a pyramid to increase leverage to acquire more resources to expropriate. This would suggest a negative relationship between leverage and firm performance.

Yet, another stand of research shows that unlike their Western counterparts, firms in emerging economies use more short term debt in their financial structure (Booth et al., 2001, Abor, 2011; Guariglia and Vijayalumaran, 2013; Du et al., 2015). At the same time, Diamond (1991) argues that a high level of short-term debt is associated with high liquidity risk (default risk/bankruptcy). This suggests that when levels

of leverage increase beyond a certain level, these firms may face high liquidity risk and lenders may become vigilant and closely monitor borrower firm behavior (Jensen and Meckling, 1976; Hadlock and James 2002).

Taken together, these agency arguments suggest that levels of leverage may be non-monotonically (U-shaped) related to corporate performance in emerging markets.

2.2 Existing evidence on the relationship between capital structure and corporate performance

McConnell and Servaes (1995) use a sample of US firms for the years 1976, 1986, and 1988 and find that leverage is positively related toTobin's Q in a low-growth firm whereas leverage is negatively related to Tobin's Q in a high-growth firm. However, their study does not control for potential endogeneity problem.

Using a sample of 557 UK firms over the period 1967 to 1989, Dessi and Robertson (2003) find that debt is positively associated with firm performance when they do not control for endogenity of debt. Yet, they show that the relationship disappear when they control for the endogeneity in the static and dynamic modeling frame work. By contrast, Berger and Bonaccorsi di Patti (2006) use a sample of 7548 US firms in the banking industry over the period 1990 to 1995 and report a positive relationship between leverage and firm performance, controlling for potential endogeneity arising from reverse causality. More recently, Margaritis and Psillaki (2010) use a sample of French manufacturing firms over the period 2002 to 2005 and report that leverage has a non-linear (inverted U-shaped) relationship with performance.

Researches focusing on emerging market also examine the relationship between leverage and corporate performance. Examples of these are Krishnan and Moyer (1997) who focusing on large firms from four emerging economies in Asia show that leverage has negative but insignificant impact on performance. Using 167 Jordanian companies over a fifteen year period, Zeitun and Tian (2007) report that a significant negative association between capital structure and firm performance measured by both the accounting and market measures. Rao et al. (2007), using a sample of Omani firms, show a negative relationship between the level of debt and financial performance.

In the context of Sri Lanka, a few studies have examined the impact of capital structure on firm performance. For example, Manawaduge et al., (2011) use a sample of 155 Sri Lankan-listed firms over the period 2002-2008 and find that most of the Sri Lankan firms finance their operations with short-term debt capital as against the long-term debt capital and provide strong evidence that the firm performance is negatively affected by the use of debt capital. Their study also finds a significant negative relationship between tangibility and performance indicating inefficient utilization of non-current assets. Using data of 25 manufacturing listed companies over the period 2008-2012, Velnamby and Nimalathasan (2013) examine the relationship between leverage and corporate performance. They find that there is a negative relationship between leverage and firm performance.

However, these studies do not examine any potential non-linear relationship between levels of leverage and corporate performance although previous studies show that leverage is non-monotonically related to performance (Margaritis and Psillaki, 2010). Furthermore, although Manawaduge et al. (2011) control for unobserved firm heterogeneity (e.g., management quality) in their regression using fixed effects model, they do not control for potential endogeneity arising from reverse causality (Berger and Bonaccorsi di Patti, 2006) or dynamic edogeneity of debt (Dessi and Robertson, 2003). This study attempt to fill this important gap in the literature.

2.3 Hypothesis

As in most other Asian and East European countries, an important governance issue among Sri Lankan listed firms is conflict of interests between majority shareholder/controlling shareholders and minority shareholders due to highly concentrated ownership structure. (Samarakoon, 1999b, Senatratne and Gunaratne, 2007). More specially, Senatratne and Gunaratne (2007) provide evidence suggesting that most of the Sri Lankan companies have concentrated ownership structure with a controlling shareholder who is usually another institutional shareholder such as the parent company or group companies, and are also characterized by wide prevalence of family ownership as the ultimate owners. They also suggest that by having control rights in excess of cash flow rights in these companies through pyramid and cross-holding structures, the controlling shareholders can reap private benefits by expropriating minority shareholders.

Furthermore, while Gunathilaka (2012) reports that concentrated ownership is positively associated with leverage, others show that leverage is negatively associated with firm performance. These studies together provide evidence consistent with the notion that controlling shareholders/ majority shareholders may prefer to use more debt in the capital structure so as to gain private benefits at the expenses of minority shareholders (see, Stulz, 1990 and Faccio et al. 2001). This would suggest a negative relationship between leverage and firm performance, as found in the previous studies in Sri Lanka.

Another strand of research (e.g., Samarakoon (1999b) and Vijayakumaran and Vijayakumarn, 2011) shows that Sri Lankan listed firms use more short-term debt than long term debt due to under developed bond markets. As argued above, at high levels of leverage, these firms are more likely to face high liquidity risk (or even default risk/bankruptcy). Therefore, we would expect that at high levels of leverage, the incentive alignment effects of debt financing overwhelm the entrenchment behavior of controlling shareholders, leading to a positive relationship between debt and corporate performance.

As a whole, these arguments thus suggest that levels of leverage may have non-linear (U-shaped) relationship with performance of listed firms in Sri Lanka. We therefore hypothesize that:

H1: There is a non-linear (U-shaped) relationship between levels of leverage and firms' performance.

3. Base line specification and estimation methodology

3.1. Baseline specification

We initially estimate following static baseline model that links corporate performance with capital structure decisions and firm characteristics:

$$perform = \beta_0 + \beta_1 tlev_{it} + \beta_2 tlev^2_{it} + \beta_3 sagrowth_{it} + \beta_4 size_{it} + \beta_5 size^2_{it} + \beta_6 tang_{it} + v_t + \varepsilon_{it} \quad (1)$$

Where *i* indexes firms, *t* years. Table 1 provides definitions and expected signs for all variables used in this paper. The error term in Equation (1) is made up of two components: v_t, a time-specific effect, which we control for by including time dummies capturing business cycle effects and $_{it}$ is an idiosyncratic component.

Since previous studies provide strong evidence that unobserved firm-specific fixed effects, endogeneity of capital structure decisions and their dynamics affect the relationship between corporate performance and debt financing (Dessi and Robertson, 2003), we estimate following dynamic model.

$$perform=\beta_0 + \beta_1 perform_{it-1} + \beta_2 tlev_{it} + \beta_3 tlev^2_{it} + \beta_4 sagrowth_{it} + \beta_5 size_{it} + \beta_6 size^2_{it} + \beta_4 tang_{it} + v_i + v_t + \varepsilon_{it} \quad (2)$$

The error term in Equation (2) is made up of three components. v_i is a firm-specific effect; v_t, a time-specific effect, which we control for by including time dummies capturing business cycle effects. ε_{it} is an idiosyncratic component.

3.1.1 Dependent variable

In this study we use two alternative proxies to measure corporate performance (denoted by *perform* in equation 1and 2), namely return on assets (ROA) and return on equity (ROE).While ROA is defined as net income (net profit) divided by year-end total assets, ROE defined as net income divided by total equity.

3.1.2 Capital structure variables

The independent variable is total leverage (denoted by *tlev*), which is used to capture the effect of capital structure decisions on corporate performance. Following Dessi and Robertson, (2003) and Margaritis and Psillaki (2010), leverage is defined as the total debt to total assets ratio. In addition, as in Margaritis and Psillaki (2010), to account for non-linear effects of leverage on performance, we include a squared term of leverage in the performance equation. As discussed earlier, while we would expect a negative relationship between leverage (*tlev*) and performance and a positive relationship between its squared term and performance.

3.1.3 Control variables

In line with previous studies (e.g., Dessi and Robertson, 2003; Margaritis and Psillaki, 2010), our regression models (equations1 and 2) also include several additional variables to control for a set of firm-specific observable characteristics that are likely to be correlated with firms' performance. These include sales growth (*salgrowth*), firm size (f*size*), squared term of firm size (f*size*^{2}) and tangibility (*tang*). This exercise would enable us to single out the impact of capital structure decisions on firm performance from other observable firm characteristics.

Growth opportunities are proxied by growth of sales which is denoted by *salgrowth*. Since growth opportunities represent a firm's growth prospects and investment opportunities, there should be a positive relationship between the growth opportunities and performance. Previous empirical studies also report a positive effect of growth opportunities on firm performance (see Claessens et al., 2002; King and Santor, 2008). In the context of Sri Lanka, Manawaduge et al. (2011) find a positive but insignificant relationship between growth opportunities and firm performance.

Firm size (f*size*) is measured by the natural logarithm of total sales at the firm level. A positive relationship between firm size and corporate performance is often considered as a stylized fact, as larger firms are expected to use better technology, be more diversified and better managed. Larger firms may also enjoy economies of scale in monitoring top management and have a higher capacity for taking risks (Himmelberg et al.,1999; Greenaway et al., 2007 and Dixon et al., 2015). However, larger firms are likely to suffer from hierarchical managerial in efficiencies and thus incur larger agency costs (Williamson, 1967). Thus, following Himmelberg et al. (1999) and Margaritis and Psillaki, (2010), we allow for non-linearity in the effect of firm size on performance by including the square of the natural log of sales in the performance equations.

Tangibility (represented by *tang*), is measured by the ratio of tangible fixed assets to total assets. Diverse relationships can be

observed between firms' performance and tangibility depending on the degree of efficient utilization of tangible assets by the firm. If a firm utilizes its tangible assets efficiently then we would expect a positive relationship between tangibility and performance, otherwise the relationship would be negative.

Finally, following Dessi and Robertson (2003) and Ammann et al. (2011), to account for persistency in performance and dynamic endogeneity of debt, we include the lagged dependent variable among our explanatory variables in Equation (2).

Furthermore, our estimates may be affected by reverse causality. The relationship between debt financing and performance may in fact be dynamic, in the sense that on the one hand, debt capital can provide incentive to managers to improve firm performance. Yet, on the other hand, a firm with higher retained earnings is likely to use less debt in their capital structure (Myers, 1984). It is therefore crucial to control for "dynamic endogeneity" in the study of relationship between capital structure and corporate performance (Dessi and Robertson, 2003).

Table 1. Variables' names, definitions and expected signs.

Variables	Name	Measures	Expected sign
Dependent Variable			
Performance	perform	Return on assets (ROA): Net income/ year-end total assets Return on equity (ROE):Net income/year-end total equity	
Independent variables			
Leverage	tlev	Total leverage/ total assets	-(H1)
	$tlev^2$	Square of tlev	+(H1)
Control variables			
Sales growth	salgrowth	Sales/Total assets	+
Size	fsize	Natural logarithm of total sales	+
	$(fsize)^2$	Square of fsize	-
Tangibility	tang	Fixed assets/ Total assets	+
Year dummies	v_t	Year dummies for the years 2009 to 2013	

3.2 Estimation methodology

To examine the extent to which capital stature decisions affects corporate performance, we first use Pooled OLS (Ordinary Least Square) model with cluster robust slandered error to estimate the equation. However, Pooled OLS does not take into account the potential endogeneity of debt arising from the unobserved firm heterogeneity for example, managerial ability and entrenchment (Zwiebel, 1996), which affect both the firm's choice of capital structure and its expected performance. OLS estimator is more likely to provide biased estimates of the coefficient on debt.

Following Dixon et al. (2015), we use the system GMM (Generalized Method of Moments) estimator (Arellano and Bover, 1995; Blundell and Bond, 1998). The system GMM estimator estimates the relevant equation (equation 2) both in levels and in first-differences. First-differencing is used to control for unobserved heterogeneity. We use all right-hand side variables (except the dummies) lagged twice or more as instruments in the first-differenced equation, and first-differences of these same variables lagged once as instruments in the level equation. The system GMM estimator addresses the potential weak instrument problem.

4. Sample and data set

The data used in this study are obtained from annual reports of individual companies listed on the Colombo Stock Exchange (CSE) for the period of 2008-2013. The sample is composed of all the publicly listed manufacturing firms. To reduce the influence of potential outliers, we exclude observations in the one percent tails of each of the regression variables. We then benchmarked the trimmed data with descriptive statistics reported in other papers to ensure that the sample was representative of the population of non-financial firms listed on the CSE. Finally, we retained all firms with at least three consecutive years of observations, in order to enable us to use the system GMM estimator. After this screening, we end up with a panel of 154 firm-year observations over the period 2009-2013 for our empirical analysis.

5. Empirical results

5.1 Descriptive statistics

Table 2 presents descriptive statistics for the variables used in the analysis for our pooled sample. The pooled mean (median) return on assets (ROA) and return on equity (ROE)are7.8% (6%) and 16.9% (12.6%), respectively. The average total debt to asset ratio is 50.1%, suggesting that about 50% of the manufacturing firms' assets are financed by debt capital. With respect to the control variables included in our baseline model, the average (median) sales growth, measured as changes in sales, is 14.2 % (12.5%). Average size of the manufacturing firms measured by sales is about 5.28 billion rupees (2.52 billion rupees). Finally, the average tangible assets of the firms proxied by the ratio of fixed assets to total assets is given by 0.516 (0.368).

These summary statistics indicate that the sample used in this study is comparable to others used in prior research on capital structure decisions in Sri Lanka, for example Manawaduge et al. (2011).

5.2 Correlation analysis

Table 3 reports the Pearson correlation coefficients between variables. Total leverage (*tlev*) shows a negative and statistically significant correlation with firms' performance measured by ROA. This result is consistent with the findings of previous studies, for example Manavaduge et al. (2011). Surprisingly, total leverage is not significantly associated with ROE. Turning to control variables, sales growth (*salgrowth)* exhibits a negative and in significant correlation with both ROA and

Table 2. Summary statistics

Variable	Obs	Mean	Std. Dev.	Median	Min	Max
Return on assets (*ROA*)	154	0.078	0.077	0.060	0.000	0.459
Return on equity (*ROE*)	154	0.169	0.173	0.126	0.000	0.807
Leverage (*tlev*)	154	0.501	0.178	0.497	0.117	1.018
Sales growth (*salgrowth*)	154	0.142	0.357	0.125	-0.634	2.529
Firm size (*fsize*) (Rs. billion)	154	5.28	6.47	2.52	6.5	28.90
Tangibility (*tang*)	154	0.516	0.579	0.368	0.017	4.476

*Notes:*This table reports summary statistics of the variables used in our study All variables are

ROE. While firm size (*fsize)* has a significant positive correlation with ROA, it is positively and insignificantly associated with ROE. Finally, the ratio of tangible fixed assets to total assets *(tang*) does not have any significant association with ROA and ROE. Furthermore, Table 3 suggests that given that the observed correlation coefficients are relatively low, multicollinearity should not be a serious problem in our study.

Table 3. Correlation matrix

	ROA	*ROE*	*tlev*	*salgrowth*	*fsize*	*tang*
ROA	1.00					
ROE	0.69*	1.00				
tlev	-0.27*	0.17	1.00			
salgrowth	-0.14	-0.18	0.25*	1.00		
fsize	0.20*	0.13	0.05	-0.04	1.00	
tang	-0.12	0.03	0.01	0.10	-0.37*	1.00

Notes: This table reports Pearson correlation coefficients. *denotes significance at the 5% level or more. See Table 1 for definitions of all variables

5.3 Multivariate analysis

Table 4 presents estimation results of our baseline model (1) using pooled OLS and of the dynamic model (2) using system GMM estimator, where the dependent variable is return on assets (ROA). In column 1 of Table 4, we first estimate a static model in which the ROA is regressed on leverage, leverage squared and a set of control variables including sales growth, firm size and tangibility and a set of year dummies. In the subsequent column, we then include lagged ROA and estimate a dynamic model.

Column (1) reports the OLS estimates. Firstly, the coefficients on leverage and its square are highly significant (at the 1% level). The former is negative, and the latter, positive. In line with hypothesis H1, these findings suggest that there is strong evidence of a curvilinear relationship between leverage and corporate performance. Specifically, the performance (ROA) first decreases, then increases as levels of leverage rise. At lower levels of leverage, the negative effect of leverage strongly dominates any positive effects. The average turning point in leverage is 56.58%.

These results are in marked contrast to the theoretical predictions of Myers (1977) and empirical findings of Margaritis and Psillaki (2010) for French manufacturing firms which suggest that at relatively higher levels of leverage, agency costs of debt may overwhelm the benefits offered by it due to the problems of under investment. Yet, our results can be explained by the fact that in emerging markets such as Sri Lanka, firms use relatively more short-term debt than long term debt such as bond/debenture (which is more prone to underinvestment problem) and also that bank loans are major source of debt financing, implying that when leverage becomes relatively high, elevating both the expected costs of

Table 4. Relationship between corporate performance (ROA), capital structure decisions and firm characteristics

Variable	Pooled OLS	Dynamic system GMM
$perform_{t-1}$		0.237**
		(0.124)
tlev	-0.275**	-0.341**
	(0.118)	(0.154)
$tlev^2$	0.243***	0.292**
	(0.078)	(0.142)
salgrowth	0.028	0.016
	(0.019)	(0.019)
fsize	-0.141	-0.163*
	(0.121)	(0.092)
$fsize^2$	0.012*	0.021**
	(0.007)	(0.01)
tang	-0.003	-0.002
	(0.012)	(0.010)
Year dummies	Yes	Yes
Observations	154	146
Inflection	56.58%	58.39%
Adjusted R^2	0.324	
F test	18.4	
P values	0.000	
Hansen test (*p values*)		0.623
AR1 (*p values*)		-0.000
AR2 (*p values*)		0.376

See Table 1 for definitions of all variables.
* indicates significance at the 10% level.
** indicates significance at the 5% level.
*** indicates significance at the 1% level. indicates significance at the 1% level. The figures reported in parentheses in column 1 are cluster robust standard errors. Estimates in columns 1 are obtained using OLS; those in columns 2 using a system GMM estimator. For the system GMM regressions reported in columns 1 and 8, *AR1 (AR2)* is a test for first- (second-) order serial correlation of the differenced residuals, asymptotically distributed as $N(0,1)$ under the null of no serial correlation. The Hansen *J* test of over-identifying restrictions is distributed as *Chi*-square under the null of instrument validity. We treat all right-hand side variables as potentially endogenous variables: levels of these variables dated *t*-2 and further are used as instruments in the first-differenced equations and first-differences of these same variables lagged once are used as additional instruments in the level equations.

financial distress, bankruptcy, or liquidation of the firms and monitoring incentives of lenders (e.g., banks), it provides insiders and controlling shareholders with the incentive necessary to avoid their misconducts and to align their interests with that of other shareholders and thus improve firms' performance. This finding is consistent with Saker and Saker (2006) and Vijayakumaran (2014) who provide empirical evidence suggesting that with the institutional developments over the period, debt financing has emerged as an important governance mechanism to mitigate agency costs for firms in India and China, respectively.

Turning to the control variables, we observe that sales growth *(salgrowth*) is not significantly associated with f i rm performance at conventional levels. This finding is consistent with the finding of Manawaduge et al. (2011). The estimated coefficient on firm size *(fsize)* is negative but not significant while the coefficient of its square *(fsize^2)*is significant at the 10% level, suggesting that large firms enjoy economies of scale, and face less asymmetric information problem and thus are able to obtain external debt capital at lower cost of capital. Finally, the coefficient associated with tangibility is negative but not significant. Consistent with Manawaduge et al. (2011), this result suggests that Sri Lankan manufacturing firms do not efficiently utilize tangible fixed assets.

The adjusted R^2 suggests that 32.4% of the total variance of the performance (ROA) is explained by the model.

As discussed in Section 3, the OLS estimates are however likely to suffer from biases due to unobserved heterogeneity, and possible endogeneity of the regressors. Therefore, in column (2) of Table 4, we present the estimates obtained with our preferred estimator, namely the system GMM estimator which control for unobserved heterogeneity and the possible

endogeneity of the regressors. We use all right-hand side variables, except the dummies, lagged twice or more as instruments in the first-differenced equation, and first-differences of these same variables lagged once as instruments in the level equation. The results show that once again, leverage and its square still display a negative and positive coefficient, respectively, and are both precisely determined. This confirms that debt capital and firms' performance are linked by a U-shaped relationship, with turning point of 58.39%.

Looking at the control variables, we observe that once again, sales growth *(salgrowth*) is not significantly associated with firm performance at conventional levels. The estimated coefficient on firm size *(fsize)* is negative and significant at the 10% level, while the coefficient of its square *(fsize^2)*is significant at the 5% level, suggesting that large firms in fact enjoy economies of scale, and face less information asymmetries in the financial markets and thus are able to obtain external debt capital at lower cost of capital. As found in column 1 of Table 4, the coefficient for tangibility is negative but not significant, suggesting that Sri Lankan manufacturing firms do not efficiently utilize tangible fixed assets.

Finally, the estimated coefficient on the lagged dependent variable is positive and statistically significant, consistent with the predictions that there is persistency in performance and dynamic effects are important (Dessi and Robertson, 2003).

The Hansen test and AR(2) statistics suggest that the instruments are valid and that there is no mis-specification in the model.

5.4 Robustness tests

As a robustness test, we estimate our preferred model 2 with return on equity (ROE) as a dependent variable instead of ROA, using the dynamic system GMM estimator.

As can be seen in Table 5, the results show that once again, leverage and it square still display a negative and positive coefficients, respectively, and are both precisely determined.

Table 5. Relationship between corporate performance (ROE), capital structure decisions and firm characteristics

Variable	Dynamic system GMM
$perform_{t-1}$	0.250*
	(0.139)
tlev	-1.444***
	(0.386)
$tlev^2$	1.281***
	(0.508)
salgrowth	-0.018
	(0.022)
fsize	-0.389*
	(0.220)
$fsize^2$	0.010*
	(0.005)
tang	0.036
	(0.058)
Year dummies	Yes
Observations	146
Inflection	56.36%
Hansen test (*p values*)	0.239
AR1 (*p values*)	0.000
AR2 (*p values*)	0.876

See Table 1 for definitions of all variables.
* indicates significance at the 10% level.
** indicates significance at the 5% level.
*** indicates significance at the 1% level.For the system GMM regressions reported in columns 1 and 8, *AR1 (AR2)* is a test for first- (second-) order serial correlation of the differenced residuals, asymptotically distributed as $N(0,1)$ under the null of no serial correlation. The Hansen *J* test of over-identifying restrictions is distributed as *Chi*-square under the null of instrument validity. We treat all right-hand side variables as potentially endogenous variables: levels of these variables dated *t*-2 and further are used as instruments in the first-differenced equations and first-differences of these same variables lagged once are used as additional instruments in the level equations.

This confirms that debt financing and corporate performance are linked by a U-shaped relationship predicted by our hypothesis H1, with turning point of 56.36%. As for the control variables, they show a similar pattern as in column 2 of Table 4. Furthermore, the Hansen test and AR(2) statistics suggest that the instruments are valid and that there is no mis-specification in the model.

6. Conclusions

The agency models of capital structure suggests that debt financing is one of the important mechanisms to mitigate agency problems and thus to improve corporate performance. This study examine the non-linear relationship between capital structure decisions and performance of Sri Lankan listed firms, using *the system* GMM estimator to control for unobserved heterogeneity, endogeneity of capital structure decisions, and their dynamics. The study uses 154 firm year observations over the period 2009-2013.

Using a dynamic modelling framework to control for control for firm heterogeneity and endogeneity of capital structure decisions, and their dynamics, we document a strong non-monotonic relationship (U shaped) between levels of leverage and firm performance. This implies that as levels of leverage increases, debt capital negatively affects performance, suggesting that debt is not efficiently utilized in the firm to increase performance; instead, it may be used by controlling shareholders to expropriate corporate resources. Yet, after a threshold level is reached, further increase in debt capital help to improve performance by constraining entrenchment behavior of controlling shareholders through the threat of liquidation.

Our study has important policy implications in that it suggests that lenders such as banks should closely monitor borrower firm's behaviour and ensure that their loans are not inefficiently used or are not used by controlling shareholders to reap private benefits. Bank regulators may also put more restriction on the use of debt capital by firms with highly concentrated ownership in order to offset controlling shareholder's incentive to use debt for private benefits. Furthermore, by providing important evidence on the efficacy of one of the important governance mechanisms, namely debt financing, our study also provides new insight into the future directions corporate governance reform in Sri Lanka.

In the present study, we have examined potential governance role of total debt. In future research, we plan to expand this study by examining how close relationship with banks and bank borrowings affect corporate performance in Sri Lanka.

References

Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. The journal of risk finance, 6(5), 438-445.

Ammann, M., Oesch, D., & Schmid, M. M. (2011). Corporate governance and firm value: International evidence. Journal of Empirical Finance, 18(1), 36-55.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of econometrics, 68(1), 29-51.

Berle, A. A., & Means, G. G. C. (1991). The modern corporation and private property. Transaction publishers.

Berger, A. N., & Di Patti, E. B. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. Journal of

Banking & Finance, 30(4), 1065-1102.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of econometrics, 87(1), 115-143.

Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. The journal of finance, 56(1), 87-130.

Claessens, S., Djankov, S., Fan, J. P., & Lang, L. H. (2002). Disentangling the incentive and entrenchment effects of large shareholdings. The Journal of Finance, 57(6), 2741-2771.

Dessí, R., & Robertson, D. (2003). Debt, Incentives and Performance: Evidence from UK Panel Data. The Economic Journal, 113(490), 903-919.

Diamond, D. W. (1991). Debt maturity structure and liquidity risk. The Quarterly Journal of Economics, 709-737.

Dixon, R., Guariglia, A., & Vijayakumaran, R. (2015). Managerial ownership, corporate governance and firms' exporting decisions: evidence from Chinese listed companies. The European Journal of Finance, (ahead-of-print), 1-39:doi/abs/10.1080/ 1351847X.2015. 1025990

Du, J., Guariglia, A., & Newman, A. (2015). Do Social Capital Building Strategies Influence the Financing Behavior of Chinese Private Small and Medium-Sized Enterprises?. Entrepreneurship Theory and Practice.

Faccio, M., Lang, L. H., & Young, L. (2003). Debt and expropriation. In EFMA 2001 Lugano Meetings.

Greenaway, D., Guariglia, A., & Yu, Z. (2014).The more the better? Foreign ownership and corporate performance in China. The European Journal of Finance, 20(7-9), 681-702.

Grossman, S. J., & Hart, O. D. (1982).Corporate financial structure and managerial incentives. In *The economics of information and uncertainty* (pp. 107-140).University of Chicago Press.

Gunathilaka, C. (2012). Ownership structure and capital structure interaction: Evidence from Sri Lankan panel data. Proceedings of the abstracts of Jaffna University International Research Conference (JUICE- 2012).

Guarigli, A., & Vijayakumaran, S. (2013). Capital structure decisions and corporate governance: Evidence from the Chinese listed companies. Proceedings of 4th Asia-Pacific Business Research Conference, Singapore, ISBN: 978-1-922069-31-3

Hadlock, C, J., and James, C, M., (2002). Do banks provide financial slack? The Journal of Finance, 57 (3), pp. 1383-1419.

Himmelberg, C. P., Hubbard, R. G., & Palia, D. (1999).Understanding the determinants of managerial ownership and the link between ownership and performance. Journal of financial economics, 53(3), 353-384.

Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *Corporate Finance, and Takeovers. American Economic Review*,*76*(2).

King, M. R., & Santor, E. (2008). Family values: Ownership structure, performance and capital structure of Canadian firms. Journal of Banking & Finance, 32(11), 2423-2432.

Krishnan, V. S., & Moyer, C. R. (1997). Performance, capital structure and home country: an analysis of Asian corporations, Global Finance Journal, 8, 129-143.

Jensen, M., and Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), 305-60.

Jensen, M., and Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), 305-60.

Manawaduge, A., Zoysa, A. D., Chowdhury, K., & Chandarakumara, A. (2011). Capital structure and firm performance in emerging economies: An empirical analysis of Sri Lankan firms.

Corporate Ownership & Control, 8(4), 253-263.

Margaritis, D., &Psillaki, M. (2010). Capital structure, equity ownership and firm performance. Journal of Banking & Finance, 34(3), 621-632.

Modigliani, F., & Miller, M. H. (1958).The cost of capital, corporation finance and the theory of investment. The American Economic Review, 261-297.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. The American Economic Review, 433-443.

Morck, R., Wolfenzon, D., &Yeung, B. (2004). Corporate governance, economic entrenchment and growth (No. w10692). National Bureau of Economic Research.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. Journal of financial economics, 13(2), 187-221.

Myers, S. C. (1977). Determinants of corporate borrowing. Journal of financial economics, 5(2), 147-175.

Rao, N.V., Al-Yahyaee, K.H.M.,& Syed, L.A.M. (2007). Capital structure and financial performance: evidence from Oman. Indian Journal of Economics and Business, 1-23.

Samarakoon, L. P. (1999a). The capital structure of Sri Lankan companies. Sri Lankan Journal of Management, 4, 18-30.

Samarakoon, L. P. (1999b). The ownership structure of Sri Lankan companies. Sri Lankan Journal of Management, 4, 143-171.

Sarkar, J., & Sarkar, S. (2008). Debt and corporate governance in emerging economies Evidence from India1. Economics of Transition, 16 (2), 293-334.

Senaratne, S., & Gunaratne, P. S. M. (2007). Ownership structure and corporate governance of Sri Lankan listed companies. Conference proceedings, the fourth international conference on business management, Faculty of Management Studies and Finance, Commerce, University of Sri Jayewardenepura.

Shleifer, A., &Vishny, R. W. (1986).Large shareholders and corporate control. The Journal of Political Economy, 461-488.

Stulz, R. (1990). Managerial discretion and optimal financing policies. Journal of financial Economics, 26(1), 3-27.

Velnampy, T., & Nimalathasan, B. (2013). Corporate governance practices, capital structure and their impact on firm performance: A study on Sri Lankan listed manufacturing companies. Research Journal of Finance and Accounting, 4(18), 69-79.

Vijayakumaran, R., & Vijayakumaran, S. (2011). Determinants of capital structure in Sri Lanka: Evidence from panel data, Proceedings of the international conference of Sri Ram Institute of Management Studies, India, 295-305.

Vijayakumaran, R. (2014). Corporate governance and corporate finance: Evidence from Chinese listed companies. Unpublished PhD thesis, University of Durham, Durham, UK.

Williams, J. (1987). Perquisites, risk, and capital structure. The Journal of Finance, 42(1), 29-48.

Williamson, O. E. (1967). Hierarchical control and optimum firm size. The Journal of Political Economy, 123-138.

Zeitun, R., &Tian, G. G. (2007). Capital Structure and Firm Performance: Evidence from Jordan. Australia Accounting Business and Finance Journal,1(4), 148-168.

Zwiebel, J. (1996). Dynamic capital structure under managerial entrenchment. The American Economic Review, 1197-1215.