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Interactive effect of financing and investment decisions among listed companies in Sri Lanka

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ABSTRACT: This study investigates the interdependent between financing and investment decision of 198 non-financial companies listed on the Colombo Stock Exchange of Sri Lanka, over the period from 2009 to 2016. This study employed the Generalized Method of Moments (GMM) model to estimate the regression models on panel data study. The major contribution of this study shows that the financing and investment decisions are determined simultaneously. The results of this study revealed that net increase in total asset was negatively significantly influenced on long term debt. Tobin's Q negatively significantly effect on total debt. Therefore, there was a marginal influenced by investment over financing decision. Furthermore, the impact of total debt on changes in total asset was insignificant and negatively significant on Tobin's Q. However, the impact of long term debt on changes in total asset was negatively significant and insignificant on Tobin's Q. Therefore, the impact of financing decision is significantly negative on investment decision.

Keywords: financing decision, investment decision, GMM, Sri Lanka

1. INTRODUCTION

The capital structure is of countless importance for a company. It provides the ratio between the amount of equity and debt capital that a firm uses to finance its assets. This ratio is important, not only because it affects the financial situation of the firm, but also because the stakeholders have different interests in this area. In addition, the capital structure gives signals to the market, which may affect the value of the company in question. For example, if a company is willing to exchange debt for equity, this can increase firm value or reduce firm risk, because there is a signal to the market that the debt capacity has increased (Myers, 1984). Hence, managers pay great attention to finding a good combination of debt and equity.

Investment opportunities play an important part in corporate finance of the firm and it specifies the future growth of the firm, which is vital in the forecast of the shareholders' wealth. Myers (1977) classifies firm value into two, the present value of the assets in place and future investment and growth opportunities. The difference between the two is that the former does not depend on future discretionary investments while the latter does. Instances of discretionary investments are; investments in new projects, advertising, marketing, research and development (R&D) and product development.

One of the important sets of questions in corporate finance is how do financing and investment decisions interrelate and what are the factors that drive these interactions? In their seminal paper, Modigliani and Miller (1958) argue that financing and investment decisions are entirely distinguishable in perfect capital markets. Subsequently that study, a rich theoretic works has examined how numerous frictions drive associations between financing and investment decisions.

Thought of organizational capital structure while determining about capital investment projects essentially means that we are making financing decision an essential part of the investment decisions. This combination of the financing and investment decisions has numerous significant implications. As forthcoming argument will disclose we shall see that this combination is not optional rather is important to make project investment decisions reflecting the true type of risk and return characteristics of each separate project. This is also the point mainly where this paper is going to bring out one of the important differences between the conventional approaches to investment evaluation and the new ones

There are many studies that investigate the sole individual association of decision independently. if these financing and investment decisions are supposed to be employed at the similar time, then previous empirical investigation invalid because the results become partial through endogeneity when seeing only one of the choices while disregarding other (Lin et al 2008).

The main objective of the study is to investigate the relationship between financing and investment decisions simultaneously for the listed companies in Sri Lanka. The remainder of this paper is organized in the following manner. The next section of the paper reviews prior research and develops the hypotheses, followed by discussion of the data, variables, method and procedures used for this empirical study. The findings and implications then follow.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The objective of this study is to investigate the interactions between financing and investment decisions of listed companies in Sri Lanka. This section provides arguments and supports for the developed hypothesis.

In general, debt financing increases value of the firm because it reduces agency costs. Managers will only invest in projects that maximize the value of the firm. Thus, financing decision policy is associated with better investment decisions. Furthermore, higher leverage produces tax shields that lead to higher firm valuation.

Overall, principal empirical study that has examined the influence of firm financing decision on investment shows inconclusive results. McConnell and Servaes's (1995) studied the association between firm value, leverage and equity ownership. They reveal a positive relationship between investment and leverage among low growth firms and negative relationship the same variables among high growth ones.

Aivazian et al. (2005) carried out a study to explore the impact of leverage on investment for 1035 Canadian industrial firms for the period from 1982 to 1999. They show leverage is negatively linked with investment and such negative association is significantly higher for

firms having low growth opportunities compared to their counterparts having high growth opportunities. Furthermore, Lang et al. (1996) find a negative relationship between leverage and investment only for low growth firm, but not for high growth firms. Jensen and Meckling (1976) and Jensen (1986) claim that debt can function as a modifying device to decrease free cash flow or decrease agency struggle between managers and shareholders of the firm. Therefore, the following hypothesis is developed.

H1: Financing decision significantly affects investment decision.

Myers and Majluf (1984) argue that firms prefer to use internal financing sources than external financing sources. Therefore, this highlights a negative relationship between debt and investment. Furthermore some other studies find a negative association between growths of the firms and leverage (Smith & Watts, 1992; Ridha & Bajka, 2010). Their results support the under investment proposition that firms decrease debt ratio vigorously to improve potential under investment incentives. (Myers, 1977). On the other hand, a positive association between growth and leverage is reported by Hall et al. 2000; Mutenheri and Green, 2003. Therefore, the following hypothesis is developed.

H2: Investment decision significantly affects financing decision

3. METHODOLOGY

3.1 Sample and Data collection

The population of the study is 287 listed companies in the Colombo Stock Exchange (CSE) as at 2016. The sample data for this study consists of 198 firms listed on Colombo Stock Exchange after excluding the financial sector of 75 listed companies. The sample period of the study was 8years from 2009 to 2016. The sample drawn for this study begins from 2009 because it makes the end of the civil war since the last three decades; In short this year marks the beginning of an environment of peaceful and conducive for the business community. The data and other related information for this study are collected from the published annual reports, (CSE) Colombo Stock Exchange websites, magazines and CSE publication.

3.2 Model Specification and definition

This study was used General Method of Movement (GMM) regression models to test the interdependent between financing and investment decisions of listed companies in CSE. Model 1 is employed to identify influence of investment decision on financing decision. Model 2 is developed to recognize the impact of financing decision on investment decision. Further, two control variables of profitability and firm size used.

Model 1: Financing decision equation

$$FINANCING = \alpha_0 + \alpha_1 INVESTMENT + \alpha_2 Profitability + \alpha_3 Firm\ size + \varepsilon$$

Model 2: Investment decision equation

$$INVESTMENT = \gamma_0 + \gamma_1 FINANCING + \gamma_2 Profitability + \gamma 3\ Firm\ size + \varepsilon$$

Table 1 Definition of the variables

Variables	**Definition**
FINANCING	Total debt to total assets ratio and, Long term debt to total assets ratio
INVESTMENT $_i$	Percentage increment in total assets from previous year to current year and Tobin Q
Profitability	Earnings before interest and tax to total assets
Firm size	Natural logarithm of total assets.

Descriptive Analysis

Table 2. Descriptive Statistics of the variables

Variable	**Observations**	**Mean**	**Std. Dev**	**Min**	**Max**
Total Debt ratio	1584	0.481	0.216	0.020	0.940
Long term debt ratio	1584	0.201	0.097	0.010	0.700
Increment in TA	1584	0.097	0.060	0.010	0.410
Tobin's Q	1584	0.832	0.468	0.020	1.990
Profitability	1584	0.075	0.111	-0.390	0.520
Firm size	1584	9.329	0.692	6.870	11.820

There are two measures of financing decision which are total debt ratio and long term debt ratio. The mean value for total debt ratio was 0.48. This means that the portions of the assets of the firm are financed with the borrowing and that was utilized as it is considered as an indication of an ability of the firm in meeting obligation of those debts. This is closely consistent with the mean value of 0.499 reported for a sample of Sri Lankan listed companies by Vijeyratnam and Anandasayanan (2015). The mean value of long term debt ratio was 0.201 which is somewhat greater than the mean value 0.156 by Sangeetha and Sivathaasan (2013) for the Sri Lankan firms.

There are two measures of investment decision which are increments in total assets, and Tobin Q. The mean value of increment in total assets shown in Table 2 was 0.097 which indicates the growth rate of investment in total assets (i.e. 9.7%). The other measure of investment decision is Tobin's Q and the mean value was 0.832. It is lower than the mean value of 1.27 reported for a sample of Sri Lankan firms by Guo and UdayaKumara (2012).

Correlation Analysis

Table 3. Correlation Matrix

	1	2	3	4	5
1. Total Debt					
2. Long Term Debt	0.465				
3. Increment in TA	-0.007	0.063			

4. Tobin's Q	-0.043	-0.095	-0.019		
5. Profitability	-0.134	-0.002	0.017	0.110	
6. Firm Size	0.054	-0.015	0.016	-0.080	0.065

The bivariate correlations are used to investigate the explanatory variables and to identify independent variables with higher correlation coefficient enabling to diagnose the variable with multicollinearity problem. Table 3 provides the matrix of Pearson correlation measuring the degree of association between the variables under the study. As per the Table, correlation coefficients are not greater than 0.8. According to Gujarati, 2003 a value of greater than 0.8 could be considered as having multicollinearity problem. The highest correlation coefficient of 0.465 was observed for the relationship between total debt and long-term debt.
In order to determine whether the results of regression analyses are clear from the issues of multicollinearity, the variance inflation factor (VIF) values are examined. VIF values of more than 10 indicate that there is a multicollinearity problem (Gujarati 2003). Tables 4and 5 show the VIF values in the financing and investment model respectively. The results show that there are no issues of multicollinearity in all models since the highest values of VIF were 1.13 in the financing model, and 1.12 in the investment model.

Table 4. Multicollinearity Test using VIF in the Financing Models.

Variables	**Financing VIF**			
Based on total debt	Based on long term debt			
Model 1	Model 2	Model 3	Model 4	
Increment in Total assets	1.01	-	1.01	-
Tobin's Q	-	1.07	-	1.07
Tangibility	1.08	1.09	1.08	1.09
Profitability	1.05	1.07	1.05	1.07
Firm size	1.11	1.13	1.11	1.13
Mean VIF	***1.07***	***1.09***	***1.07***	***1.09***

Table 5. Multicollinearity Test using VIF in the Investment Models.

Variables	**Investment VIF**			
Based on Increment in Total assets	Based on Tobin's Q			
	Model 1	Model 2	Model 3	Model 4
Total debt	1.04	-	1.04	-
Long term debt	-	1.01	-	1.01
Tangibility	1.08	1.09	1.08	1.0
Profitability	1.07	1.05	1.07	1.05
Firm size	1.12	1.11	1.12	1.11
Mean VIF	***1.08***	***1.07***	***1.08***	***1.07***

Regression analysis

Table 6. System GMM Estimation of Regression Results for Financing Decision

	Total Debt Ratio		Long term debt Ratio	
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coef.	**Coef.**	**Coef.**	**Coef.**
TD/TA (-1)	0.841***	0.833***		
LTD/TA (-1)			0.847***	0.774***
Changes in total assets	0.021		-0.026***	
Tobin's Q		-0.025***		-0.001
PRO	-0.275***	-0.247***	-0.068**	-0.071***
Log FS	0.023***	0.017***	0.007***	0.011***
constant	-0.114***	-0.010	0.008	-0.008
No. of groups	198	198	198	198
No. of instruments	148	148	148	148
AR(2)	0.369	0.368	0.542	0.563
Hansen test	0.341	0.292	0.128	0.212

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level

Financing decision's regression results are deliberated in four models, in which model 1 and model 2 are constructed on total debt, and model 3 and model 4 are constructed on long term debt financial decision. The impact of changes in total asset is significantly negative on the long term debt ratio in model 3. According to the results of the regression presented in Table 5, the coefficient value was -0.026. And Tobin's Q is significantly negatively influencing the total debt ratio in model 2. As per the regression results presented in Table 5, the coefficient value was -0.025. Therefore, the impact of investment decision is significant negative on financing decision. These negative results are consistent with the study of Lang et al. (1996) who found a significantly negative effect of investment on financing decision for the US firms. The findings also support the agency theories concerning corporate leverage, specifically the theory assumes that debt has a key function of disciplining firms with low growth opportunities. However, the changes in total asset and Tobin's Q have not yielded significant results in model 1 and 4 respectively. Therefore, hypothesis H1 stated that there is a significant influence of investment decision on financing decisions of a firm was supported. Among the control variables, profitability is consistently significant and negatively related to financing decisions according to the regression Table 6. Firm size is consistently significant and positively linked to financing decisions.

Table 7. System GMM Estimation of Regression Results for Investment Decisions

	Changes in total assets		Tobin's Q	
	Model 1	Model 2	Model 3	Model 4
	Coef.	Coef.	Coef.	Coef.
TA (-1).	0.435***	0.375***		
Tobin's Q (-1)			0.549***	0.524***
TD	-0.010		-0.055**	
LTD		-0.027***		-0.118
PRO	-0.025**	-0.035***	0.526***	0.624***
Log FS	0.006**	0.005*	-0.206***	-0.219
constant	0.006	0.004	2.281***	2.437***
No of groups	198	198	198	198
No of instruments	148	148	148	148
AR(2)	0.228	0.440	0.276	0.305
Hansen test	0.596	0.668	0.176	0.236

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level

Investment decision's regression results are deliberated in four models, model 1 and model 2 are constructed on changes in total assets and model 3 and model 4 are constructed on Tobin's Q for investment decision. The impact of total debt on changes in total asset and Tobin's Q was negatively insignificant with the co efficient value of -0.010 and negatively significant with the co efficient value of -0.055 respectively. However, the impact of long term debt on changes in total asset and Tobin's Q was negatively significant with the co efficient value of -0.027 and negatively insignificant with the co efficient value of -0.118 respectively. Therefore, the impact of financing decision is significantly negative on investment decision. Hence, hypothesis H2 stated that there is a significant influence of financing decisions on investment decision of a firm was supported. Furthermore, firm's profitability was found to be significant negative in changes in total assets. In contrast, it has recorded significant positive effect on Tobin's Q. The firm size variable displayed significant positive association with changes in total assets. The results of the research indicated that firms with large size are able to invest more in investment projects compared to small firms. Whereas, firm size displayed a significant negative impact on Tobin's Q in model 3.

4. CONCLUSION

The objective of the research was to examine the interdependent between financing and investment decision of 198 non-financial companies listed on the Colombo Stock Exchange of Sri Lanka, over the period from 2009 to 2016. Financing decision was assessed using two measures of total debt ratio and total long-term debt ratio. Investment decision considered two measures namely increment in total assets from previous year to current year and Tobin's Q. Furthermore, this study included controlling variables of profitability and firm size .The impact of changes in total asset is with negative and significant impact on long term debt ratio in model 3. Tobin's Q is negatively and significantly influencing on total debt ratio in model 2. Therefore, there is a marginally negative influence of investment decision on financing decision. The impact of changes in total asset is with negative and significant impact on long term debt ratio in model 3. Tobin's Q is negatively and significantly influencing on total debt ratio in model 2.The impact of total debt on changes in total asset is insignificantly negative,

whereas it was significantly inverse effect on Tobin's Q. The impact of long term debt on changes in total asset is significantly negative, whereas it is insignificantly negative on Tobin's Q. Therefore, there is a significant negative influence of financing decision on investment decision.

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