Does Agency Problem Influence the Firms' Choice of Capital Structure?

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ABSTRACT

Managers have often used their position and expertise to their benefit which has led to the agency problem where managers and executives try to increase their profit rather than working for the shareholders. This study seeks to analyze the impact of agency problem on the choice of capital structure using a data of 494 firms that are listed on the NYSE. The results show that an increase in the agency cost leads to an increase in the debt to equity ratio of the firms.

Keywords: Agency problem, choice of capital structure, foreign firms, NYSE, asset turnover ratio.

 INTRODUCTION

Singh and Davidson (2003) analyze the relationship between corporate ownership structure and agency cost in large publicly traded corporations. They have considered a sample of NYSE, AMEX and NASDAQ firms having sales more than $ 100 million and have excluded the firms in the financial service industry and utility industry. They find that managerial ownership is positively related to asset utilization. Also, they show that in large publicly traded corporations' managerial ownership significantly reduces the agency problems in corporations.

This paper seeks to extend the analysis of Singh and Davidson (2003) to all the publicly listed foreign firms listed on the NYSE. The influence of agency cost on the choice of capital structure would differ across foreign firms for a number of reasons. Singh and Davidson (2003) have used a sample of US firms which would have different set of factors influencing them compared to foreign firms from other countries. Financial literacy varies across investors in different countries. Christelis, Jappelli and Padula (2006) and Alessie, Lusardi and van Rooji (2007) indicate that financial literacy impacts the stock market decisions of investors. This would impact the ability of the firm to go in for debt or equity.

Also, foreign firms listed on the NYSE would be cross listed hence they would face the benefits and the limitations of cross listing in a foreign country. The benefits of cross listing are access to lower cost of capital, reduced risk premium, enhanced investor protection and access to more developed markets. The limitations of cross listing are greater disclosure requirements for firms listed in the US, greater scrutiny by the press, different cross listing requirements in the US. Doidge et al (2004).

Several papers have documented the home bias phenomenon of the investors; French and Poterba (1991), Tesar and Werner (1995), Cooper and Kaplanis (1994), Lewis (1999), etc. Home bias phenomenon would also have an impact on the ability of the investors to invest in foreign firms listed on their stock exchange. Investors may not be willing to invest in firms which are listed on the foreign stock exchange as these firms would have to abide by the rules and regulations of the foreign stock exchange which may or may not be favorable for foreign investors. King et al (2003) show that cross listing does not mitigate home bias of US investors. Hence cross listed firms would face skepticism from investors in the country in which they are listed.

Also, United States passed the Sarbanes Oxley Act in 2002 which requires all publicly listed firms to adhere to enhanced levels of corporate accounting controls. This act came into existence after some of the major accounting scandals like Enron, Tyco International, Adelphia, Peregrine Systems and WorldCom. The passage of this act means that cross listed firms are also subject to more scrutiny and hence the ability of the investors and their risk perception towards such firms would also be affected.

These factors listed above would have an impact on the choice of capital structure of the firm as well as the agency costs. Hence, this paper seeks to extend the analysis of Singh and Davidson (2003) to the foreign firms that are listed in NYSE by analyzing the impact of agency problem on the choice of capital structure of the firms.

LITERATURE REVIEW

This section discusses some of the previous papers that have analyzed the agency problem and its impact on capital structure. One of the first papers in the field of agency

problem was the paper of Jensen and Meckling (1976). They provide the theory of the firm which helps to explain several aspects of the agency problem. They find that the level of agency costs depends on statutory and common law and human ingenuity in devising contracts.

An existing strand of literature analyzes the impact of agency cost of debt on the optimal capital structure. Mao (2003) finds that the total agency cost of debt does not uniformly increase with leverage. Hatfield et al (1994) have considered the effect of firm and industry debt to determine the optimal capital structure. They find that support for the Modigliani and Miller (1958) proposition. Their results indicate that the relation between the firm's debt level and the industry does not concern the market. Contrary to some of these results Harvey et al (2004) find that that debt mitigates the presence of higher agency costs to managers and agency problems for shareholders. Leland (1998) finds that agency costs may not be positively related to the optimally chosen levels of leverage and that the agency costs of debt are far lesser than the tax advantages of debt. Williams (1987) finds that financial leverage can reduce agency cost through the threat of liquidation.

Some of the other empirical work analysis the impact of agency cost on an all equity capital structure. Zhang et al (2007) find that that an all equity capital structure increases the firm's agency cost of debt and lowers the debt capacity. Also, Agarwal and Nagarajan (1990) find results consistent with the argument that managerial control of all equity capital structure is aimed at reducing the risk associated with their personal funds. Contradictory to the results of Agarwal and Nagarajan (1990), Gardner and Trzcinka (1992) find support for the pecking order theory which states that firms first use their internal available funds and then go in for equity. Iyengar et al (2005) analyze the pay performance sensitivity for all equity firms relative to the firms with more debt. They find a positive relationship between Return on Equity and the level of compensation for all equity firms.

He (2007) investigates the impact of agency problems in various economic contexts. He finds a negative relation between pay performance sensitivity and firm size, and the interaction between debt-overhang and agency issue leads smaller firms to take less leverage relative to their larger peers.

Berger and Patti (2006) use a new approach to analyze the agency problem. They test the corporate governance theory of the impact of leverage on firm performance. They find that the higher leverage or lower equity capital ratio is associated with higher profit efficiency. Their findings are consistent with agency cost hypothesis.

Other researchers have considered other factors while analyzing the impact of agency cost on the choice of capital structure. Haugen and Senbet (1988) analyze the impact of bankruptcy and agency costs on the optimal capital structure of the firm. They find that the potential impediments to bankruptcy problems can be easily overcome if capital markets are competitive. Also, the existence of complex contracts (callable bonds) can reduce agency problems. Harris and Raviv (1990) analyze the effect of debt on investor's information and their ability to oversee the management. They find that role of debt plays an important role in allowing investors to generate information useful for monitoring management. Subramanian (2007) analyzes the effect of agency costs on firm value, capital structure and credit risk. He finds that agency conflicts have a major impact on the firms' value, capital structure and value of risky debt and equity. Kim and Sorensen (1986) empirically test the impact of agency costs on debt policy. They find that higher growth firms use lesser debt and higher operating risk firms use more debt. Also, firm size is not correlated with the debt. Denis et al (1997) analyze the agency cost hypothesis to test whether managers derive benefits from diversification. They find a

strong relation between decreases in diversification and external corporate control threats. This suggests that refocusing could be due to external monitoring of managers.

The ownership structure of the firm that is whether the firm is managed by a family or an outsider could also influence the agency problem in the firm. Ang et al (2000) analyze the variation in agency costs due to changes in the ownership structure. They find that the agency costs are higher when an outsider manages the firm and they reduce if there is external monitoring by banks.

METHODOLOGY

Sample Selection

The data for the paper consists of a sample of 494 foreign firms listed on the NYSE from January 1990 to December 2010. The data for all the variables was collected using CompStat.

Agency cost is measured by the asset turnover ratio (which is the ratio of Sales to the Total assets of the firm) as measured by Singh and Davidson (2003). Asset turnover ratio can be considered to be a measure of efficiency or firm performance within the organization as it shows the amount of sales that are generated for a given level of assets. A higher asset turnover ratio shows a better management of the assets within the firm but a lower asset turnover ratio could indicate the usage of assets for unproductive purposes which would increase the agency conflict within the firm.

Capital structure indicates the debt equity mix within the firm. Capital structure is measured byg the debt equity ratio. The debt equity ratio of the firm clearly indicates the capital structure of the firm. While a debt equity ratio of 0 indicates an all equity firm, a debt to equity ratio of 1 would indicate a proportionate investment in debt and equity. A debt to equity ratio larger than 1 would indicate a firm opting for more debt compared to its equity. The debt to equity ratio is measured as shown in Bhandari (1988).

Control Variables

Empirical research testing the agency cost hypothesis usually regress variables of firm performance against the equity capital ratio or tobin's q or other measures of leverage besides other control variables. The control variables used in this paper are Tobin's q, ROA, Research and Development Expenditure, size of the firm, and Free Cash Flow. ROA is measured by the ratio of Net Income to the Total Assets. The size of the firm is an important another control variable because larger firms may have a better asset utilization ratio as they can diversify their assets across different business segments and increase their sales. Size of the firm is measured as the natural logarithm of annual sales.

`Tobin's q is another important control variable for firm performance as it is a ratio of the market value of the company to the total assets. An increase in the tobin's q indicates an increase in the firm performance. Tobin's q is defined as per Almazan (2010). Market Value is defined as Total liabilities minus the balance sheet deferred taxes and investment tax credit plus the preferred stock plus the market equity (product of common shares outstanding and the stock price).

Research and Development expenditure within the company would indicate the investment of the company in research and technological knowhow and often companies that invest in research and development are able to launch better and more innovate products in the market. Hence, research and development expenditure is also one of the control variables for firm performance.

Free Cash flow indicates the cash available to the company after spending the money required to expand its asset base. It allows the company to enhance its shareholder value, reduce its debt. Hence it is important to control for free cash flow. Free cash flow is calculated as shown in Zhang (2007) as the ratio of the sum of Income before Extraordinary Items and Depreciation and Amortization Expenses to the total assets.

Summary Statistics

Table 1 (appendix) shows the summary statistics of the variables. The summary statistics indicate that the average asset turnover ratio is 0.5836 with a median of 0.4938. The debt to equity ratio has an average of 0.5071 and a median of 0.4609. Return on Asset has an average of 0.0507 and a median of 0.0438. Free Cash Flow has an average of 0.0922 and a median of 0.0874. Size has an average of 3.3787 and a median of 3.3912. Tobin's q has an average of 1.4903 and a median of 1.1602. Research and Development expenditures has an average of 708.7436 and a median of 66.3135. It also has the highest standard deviation which indicates that the companies have a wide variation in their research and development spending. The least standard deviation was observed for the variable of free cash flow which indicates that the companies do not have a large difference in the amount of cash available to the company after expanding its asset base.

Correlation matrix

Table 2 (appendix) shows the correlation matrix for all the variables. The only correlation that is of concern is the correlation between free cash flow (freecashf) and return on assets (Roa). All the other correlations are well below 0.6. A check of the variance inflation factor (VIF) was conducted to ensure that the variables used were adequate and appropriate for analysis. Table 3 (appendix) shows the VIF for all the variables. The results for the VIF show a mean VIF of 3.60 and the VIF for free cash flow and return on assets is a bit high which could indicate multicollinearity but the VIF is still less than 10 which is considered to be the cut off value.

Empirical Model

The equation for the model is as shown below

Asset Turnover Ratio = $\beta_0 + \beta_1$ * Return on Assets + β_2 * Debt Equity Ratio + β_3 * Free Cash Flow + β_4 * Sizes + β_5 * Tobinq + β_6 * Xrd + ε

where

β_0 is the constant term. β_1, β_2, β_3, β_4, β_5, β_6 are the coefficients for Return on Assets (Roa), Debt Equity Ratio (Debteqr), Free cash flow (Freecashf), Size (Sizes), Tobinq (Tobinq) and Research and Development Expenditure (Xrd). ε is the error term in the regression.

EMPIRICAL RESULTS

Four different methods were used to compare the results of the regression. The column titled 'Regression' indicates the results of the standard OLS regression technique. The column titled 'Hetroskedastic' indicates the results of the regression after considering the Hetroskedastic robust standard errors. It is important to consider the Hetroskedastic robust standard errors because if there is any heteroskedasticity present that is if the error variance is not constant given any values of the explanatory variable then the standard errors which are shown in the parenthesis are affected and if the standard errors are affected then they will affect the significance of the individual variables.

In this case all the variables are not in the same units. Hence as a robustness technique the standardized beta coefficients were used. Using standardized beta coefficients helps in interpreting the coefficients of all the variables in terms of the change in the standard deviation. In this case the variables Roa, Debteqr, Freecashf, Tobinq are all in the ratio form. Sizes is in the logarithmic form and Xrd is in the numerical form hence it is important to compare the standardized beta coefficients and to check whether using the standardized beta coefficients affects the significance of any of the variables. The column titled 'Standardized' indicates the results of the regression analysis using the standardized beta coefficients.

Robust standard errors are those standard errors which are not affected by the outliers that are present in the sample. The results for the regression using robust standard errors is shown in the column titled Robust. As can be seen the standard errors for the variables here have slightly different standard errors compared to those in the column titled Hetroskedastic.

Table 4 (appendix) shows the results of the regression analysis. The dependent variable is asset turnover ratio. The independent variables are return on assets (Roa), Debt Equity Ratio (Debteqr), Free cash flow (Freecashf), Size (Sizes), Tobinq and research and development expenditure (Xrd). The significance levels used here are less than 1%, 1% and 5% levels of significance.

The significance levels of the variables do not change after controlling for hetroskedasticity or after using robust standard errors which indicates that there is no hetroskedasticity present in the original regression. Also, the significance level is not affected by using standardized beta coefficients. This is important because as explained earlier all the variables are not in the same unit.

The results indicate that there is positive correlation between the asset turnover ratio and return on assets, debt equity ratio, Size and Tobin Q in all the four regressions. This shows that an increase in the asset turnover ratio leads to an increase in the return on assets, an increase in the debt to equity ratio, an increase in the Tobin's Q and an increase in the size.

The results also show that there is a negative correlation between the asset turnover ratio and the research and development expenditure which indicates that an increase in the asset turnover ratio leads to a decline in the expenditure on research and development. This is a surprising result considering the fact that an increase in sales should ideally indicate that the company is willing to diversify into new segments which should increase the research and development expenditures which is not the case here.

The results for the variable of free cash flow indicate that there is a negative correlation between asset turnover ratio and free cash flow which means that an increase in the sales relative to the total assets leads to a reduction in the free cash flow of the company.

CONCLUSION

The results indicate that the agency cost influence the debt equity ratio. This shows that the agency cost has an impact on the capital structure of the firm. An increase in the agency cost leads to an increase in the debt to equity ratio which means that with an increase in the agency cost will increase the company would go in for more debt instead of equity. This could be because the managers of the firm would want to go in for more risky projects which would need them to raise more debt through the financial institutions.

The results support for the pecking order theory of capital structure along with an increase in the agency cost. The pecking order theory states that the firm would go in for internal sources of financing, followed by debt and would go in for external equity as the last resort. Also, the results indicate that an increase in the agency cost leads to an increase in the percentage of debt in the firm relative to the equity which supports the pecking order theory.

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APPENDIX

Table 1: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max	Median
Atrs	4933	0.5836	0.4663	0.0011	5.0902	0.4938
Roa	4933	0.0507	0.9580	-1.7437	1.9928	0.0438
Debteqr	4933	0.5071	0.3058	0	1	0.4609
Freecashf	4933	0.0922	0.1006	-1.5678	1.9951	0.0874
Sizes	4933	3.3787	0.8983	-0.9208	5.6612	3.3912
Tobinq	4933	1.4903	1.1371	-0.1707	20.0674	1.1602
xrd	1756	708.7436	1466.119	0	10092.58	66.3135

Table 2: Correlation Matrix

	Atrs	Roa	Debteqr	Freecashf	Sizes	Tobinq	Xrd
Atrs	1.0000						
Roa	0.1324	1.0000					
Debteqr	0.0751	-0.1866	1.0000				
Freecashf	0.0798	0.9287	-0.1767	1.0000			
Sizes	0.1533	0.0631	-0.0654	0.1405	1.0000		
Tobinq	0.0220	0.1813	-0.5544	0.1581	-0.0338	1.0000	
Xrd	0.0401	-0.0177	-0.0090	-0.0306	0.5213	0.0309	1.0000

Table 3: Variance Inflation Factors

Variable	VIF	1/VIF
freecashf	7.92	0.1262
Roa	7.76	0.1289
Sizes	1.53	0.6532
Tobinq	1.48	0.6747
Debteqr	1.48	0.6757
Xrd	1.44	0.6944
Mean VIF	3.60	

Table 4: Regression Results

Ind Variable	Regression	Hetroskedastic	Standardized	Robust
Roa	2.3384 *** (0.2686)	2.3384 *** (0.2699)	0.5544 *** (0.2686)	2.3384 *** (0.2660)
Debteqr	0.2580 *** (0.0430)	0.2580 *** (0.0442)	0.1669 *** (0.0430)	0.2580 *** (0.0440)
Freecashf	-1.9051*** (0.2674)	-1.9051*** (0.2618)	-0.4585 *** (0.2674)	-1.9051 *** (0.2588)
Sizes	0.1161 *** (0.0134)	0.1161 *** (0.0145)	0.2458 *** (0.0133)	0.1161 *** (0.0145)
Tobinq	0.0300 *** (0.0085)	0.0300 *** (0.0073)	0.0976 *** (0.0085)	0.0300 *** (0.0072)
Xrd	-0.00002*** (7.92e-06)	-0.00002*** (6.67e-06)	-0.0937 *** (7.92e-06)	-0.00002*** (6.62e-06)
Constant	0.3037 *** (0.0568)	0.3037 *** (0.0576)		0.3037 *** (0.0572)
R-squared	0.0854	0.0854	0.0854	0.0854
F-Statistic	27.22	29.27	27.22	29.90

*** ** * Significant at less than 1%, 1% and 5% level.