

# Impact of Managerial and Institutional Ownership on Capital Structure: A Comparison Between China & USA

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## Abstract

This study seeks to investigate how managerial ownership (MNO) and institutional ownership (INST) affect firm debt financing in the two biggest economies. Using Ordinary Least Squares (OLS) on a panel data sample of developed (USA) and developing (China) economies from 2009-16, we found a non-linear relationship between Managerial ownership and debt for China but not for the USA; a positive relation between Institutional ownership and debt for USA and negative for China. The findings of this study imply that with the development of economies, the role of Institutional shareholders becomes stronger who prefer to rely more on debt financing. However the managerial ownership plays a dominant role when level of managerial ownership is high, irrespective of the level of development.

**Keywords:** ownership structure; debt financing; managerial ownership; institutional ownership; corporate governance; developed/developing economy

## 1. Introduction

A key issue concerning every firm is the choice of its capital structure; whereby any misjudgment can result in substantial costs. In particular the debt structure of a firm, its impact on firm's performance and the role of associated agency conflicts are extensively researched topics. Firm-specific factors like ownership play important role in determination of debt. A particular debt mix for a particular company can reduce agency costs and increase the firm value that has always been a topic of great debate in financial theory and practice.

Seminal papers by Jensen and Meckling (1976) and Grossman and Hart (1982) create an image of a firm with separation of ownership from management. Where clash of interests of two groups (owners and managers) demands control mechanisms to reduce resulting agency costs. At the core of corporate governance is to implement and ensure such controlling mechanisms that balance interests of stakeholders of a firm and reduce agency costs. One such mechanism is the ownership structure. The ownership structure of a firm comprises of different groups like corporations, institutions, managers, government agencies, the general public, etc.

Managerial ownership and institutional ownership are two measures of ownership structure. Plenty of research has been done on the relationship of capital structure with the above two mentioned measures in developed and developing countries like Hayat et al. (2016), Ganguli (2013), Chung (2012), Du and Dai (2005), Ross (1977), Friend and Lang (1988) and Lundstrum (2009) but a straightforward answer is still to be figured out. Evidence gathered from different countries separately is inconsistent even contradictory at times. It demands a comprehensive and comparative investigation across countries. Theories like Agency, portfolio and trade-off explain the relationship between managerial ownership and debt might be non-linear. Few studies such as Short et al. (2002), Brailsford et al. (2002) and Pindado and De La Torre (2011) have considered the non-linear relationship between managerial ownership and debt. They also considered the interaction between managerial ownership and institutional ownership with its impact on debt. Again even results of these few studies are not matching with each other. Moreover, proposition within the lower range of managerial ownership is needed to be revised.

The general objective of the current study is to understand the relationship between ownership structure of a firm and its debt. The specific objective of this research is to comprehensively investigate whether this relationship changes with data originating from different countries. According to Mehran (1992), differences of results in the literature on a particular topic is either due to different data sets or different methodology. Therefore two largest economies namely USA and China are selected for analysis, representing developed and developing economies respectively. For these countries, only mid-sized firms are selected for analysis (explained in Data & Methodology section). The final sample comprises of 275 medium-sized firms (183 from USA and 92 from China), obtaining data for a time period of eight years from 2009 to 2016, and a total of 2106 observations. The econometric technique, Ordinary Least Squares (OLS) is used for estimation of results for each country.

General findings suggest that in medium-sized firms relationship between managerial ownership and debt is non-linear in China and the other way around in the USA. In the USA where institutional ownership is 82% on average, managers avoid debt at both low and high level of managerial ownership. Institutional ownership and debt are substitutes of each other in China but not in the USA where the complementary effect of both holds.

## 2. Review of Literature

Literature review is divided into two segments as follows:

### 2.1 Debt and Managerial Ownership

Jensen and Meckling (1976) define agency relationship between principal (owner of a firm) and agent (manager of a firm) where the former deals with the latter to perform some services on their behalf with some discretion over decision making. Both parties want to maximize their personal interests which are often conflicting. It is well noted by a growing amount of research that capital structure decisions are influenced by behavior, goals, ambitions, and preferences of managers and shareholders (Grossman and Hart, 1982; Jensen and Meckling 1976; Sun et al., 2015; Brailsford et al., 2002; Pindado and De La Torre, 2011; Short et al., 2002).

Grossman and Hart (1982) discuss that managers with no ownership stakes in the firm bond themselves with more debt to increase firm value. Jensen and Meckling (1976) explain that debt reduces free cash flow under the control of management. Managers ensure timely payments of interest and it limits their use of resources for personal benefits. If debt limits the usage of free cash flow for managers and increases non-diversified risk then why would they choose debt as a source of finance? Grossman & Hart (1982) put forward three reasons. First, managers might have incentives like profit sharing or stock options attached to the firm value. Second, corporate charter can permit or even encourage firm take over. Usually, undervalued firms are easy targets for takeover. It is in the interest of managers to increase the value of the firm and avoid any potential takeover. Third, if managers use only equity for finance then for an outside investor it is a negative sign. Investor perceives that managerial discretion is high in the more equity driven firm and managers are avoiding debt. On the other hand, if managers use debt for finance, investor perceives that management is committed to maximize profits even if debt reduces managerial discretion. Therefore, management uses more debt because it attracts more investment. More investment means more perquisites to consume for managers.

Agency costs arise when managers do not take decisions in the best interest of owners. According to Jensen and Meckling (1976), agency cost is zero if a firm is managed by the sole owner and it increases as sole owner sells his own residual claims to outside investors. Thus we can infer that magnitude of agency costs varies with variation in managerial ownership. Jensen and Meckling (1976) argue that managerial ownership reduces agency cost by aligning interests of managers with owners, also known as interest alignment hypothesis. According to Jensen and Meckling (1976), managerial ownership dismisses need of debt to control incentive pro behavior of managers because both are substitutes for each other. Both managerial ownership and debt solve agency conflicts between managers and owners. Therefore, the need for debt reduces as the managerial ownership increases. If we compare the situation of non-owner managers with owner-managers, it is obvious that owner-managers have both human and nonhuman capital at stake with the performance of the firm. More non-diversified investment of owner-managers integers more risk aversive attitude. Thus, risk aversive owner-managers avoid debt in capital structure due to the risk of financial distress and bankruptcy.

Al-Fayoumi and Abuzayed (2009) conducted a time-series cross-sectional analysis of 311 manufacturing firms over 18 years of the time period to see effects of agency cost and ownership concentration on capital structure. They found that diffused ownership of firm provides managers discretion over financial decisions and they choose capital structure with lower debt. Managers tend to adjust debt as agency cost changes with a change in the composition of equity ownership.

Pindado and de La Torre (2011) conducted a study, using data sample of 135 listed non-financial Spanish companies. They proposed that firm's ownership structure can help to explain the choice of debt and equity. They used Generalized Method of Moments technique for estimation of results. According to their study, capital structure is partially decided by those who are in control of the firm. From interest alignment perspective, they found that managerial ownership does not affect debt when goals of managers are aligned with owners of the firm.

One point missing in the above discussion is tax and cost advantages of debt financing. Modigliani and Miller (1963) show that in the real world, tax subsidy on interest payments increases the value of the firm. Further, they argue that there are costs of debt like restrictions imposed by lenders and problem of financial strategy. Managers are likely to expropriate wealth from debt holders at a lower level of managerial ownership. That would increase agency cost related to debt and consequently, debt holders are more likely to include strict covenants in debt agreements. Strict covenants affect the value of the firm as it might restrict even necessary investments that otherwise could be made with equity. According to Jensen and Meckling (1976), it is in the interest of owner-managers to take into account the costs of such covenants in debt agreements because it directly affects the future earnings of the firm and hence reduces the market value of their residual claim. Cost of internal and external monitoring is imposed on the owner-managers and it is in their interest to reduce the monitoring cost.

On one side, debt is not favorable for owner-manager because it increases non-diversified risk, limits managerial discretion and increases agency cost related to debt. On the other side, debt is favorable because it

has a tax advantage and it reduces chances of firm take over. Further, debt increases manager value in the manager market and it is a positive signal that increases the availability of finance for a firm to grow. Therefore, at a lower level of managerial ownership, substitute effect of debt is not plausible rather a complementary effect.

The relationship between managerial ownership and debt has further complications. According to Short et al. (2002), managerial ownership increases the discretionary power of managers. Managers get more control over the financial decisions like reduction of debt. Managers become entrenched with an increase in managerial ownership. They get more control over the firm and make financing decisions in their favor. Ganguli (2013) finds that entrenched management with comparatively less debt and no outside monitoring increases agency costs. With no outside shareholder monitoring, entrenched managers avoid debt and prefer retained earnings or equity as a source of financing.

Lundstam (2009) addresses two problems raised in the literature. First, if managerial ownership affects agency costs attached with capital structure then what are security issuance valuation effects of these agency problems while controlling outside blockholder share ownership? Second, is the relationship between change in debt and managerial ownership monotonic? He finds that with a medium range of ownership, managers (entrenched managers) issue less debt as compared to a high range of ownership. Furthermore, the size of the decline in debt before the security issuance is positively related to the managerial ownership (this result is for entrenched managers). Brailsford et al. (2002) also find a non-linear relationship between managerial ownership and leverage.

## *2.2 Debt and Institutional Ownership*

According to Stiglitz (1985), small individual shareholders do not have the advantage to monitor managers' actions. They do not have the capability to mold managers' behavior in the best interest of owners. Monitoring requires expertise to collect and use relative information that a small individual shareholder is not likely to have. Free rider problem that others enjoy the same reward without any effort and the cost outweighs the benefits attached to monitoring.

However, Sun et al. (2015) emphasize that typical institutional shareholders like pension funds, mutual funds, insurance companies and banks have the capacity to monitor and influence financing strategies to their personal interest. Short et al. (2002) propose that shareholders with large ownership may have the incentive to monitor and control self-serving decisions and behavior of managers. This particular role of institutional investors is known as institutional shareholder activism and it reduces the cost of debt.

Jensen and Meckling (1976) declared debt as a monitoring mechanism that reduces cash flow under the hands of management and bounds them to make interest payments possible in future. Thus, institutional shareholders and debt both serve as disciplinary mechanisms. According to Short et al. (2002), the relationship between institutional shareholders and debt depends upon whether both serve as a substitute for or complement to each other.

Friend and Lang (1988) say that large external shareholders are more likely to hold highly diversified portfolios. Short et al. (2002) argue if large external shareholders hold highly diversified portfolios then cost of direct monitoring is likely to be prohibitive. Therefore, institutional shareholders are more likely to prefer debt as a monitoring tool than direct monitoring. Hence institutional shareholders use debt as a complementary mechanism with other disciplinary tools.

Porta, Lopez-de-Silanes and Shleifer (1999) looked at ownership pattern of large publicly held companies. They analyze ownership structure of 20 large publicly held corporations in each of the 27 generally richest economies. They found that controlling shareholders gain significant power over firms through the use of pyramid ownership and participation in management. Du and Dai (2005) studied potential effects of divergence of control rights from cash flow rights on debt. They use data (1994-1996) from nine countries for analysis. Sample size contains 1473 firms for market leverage analysis and 1484 firms for book leverage analysis. Their empirical evidence supports that controlling owners with relatively small share prefer leverage and avoid ownership dilution. Separation of cash flow rights from control rights encourages controlling shareholders (with more control and relatively small ownership) to increase leverage to a dangerous level. Controlling shareholders are more likely to share less loss and high profit. This behavior is due to weaker corporate governance in Asian countries that added more severity to the financial crisis.

Based on above two significant papers, the current study expects a high level of controlling shareholders and debt in developing countries as compared to developed countries. Therefore, it is expected that the relationship of debt with different ownership measures could be influenced by controlling owners. Moreover, the level of managerial ownership and institutional ownership is expected to be lower in developing countries as compared to developed countries.

Brailsford et al. (2002) used data from 49 firms, listed on Australian Stock Exchange for a period of 1989-1995, to inquire relationship between the ownership structure and the financing policies. They used OLS regression analysis to estimate results. Results show a positive relationship between external blockholders and

leverage. Ganguli (2013) addressed three questions related to the relationship of debt with concentrated shareholders and managers, using data from India. First, if concentrated ownership and debt both work as an agency cost mitigating device then what is a relationship between two? Second, if a firm has dispersed ownership, what is preferable to managers, insider monitoring by shareholders or monitoring by lenders. Third, does capital structure determine ownership structure? The study uses data from 80 companies (CNX Midcap index), for a period of five years from 2009 to 2014. Results of fixed effect regression model show that there exists a positive relationship between ownership concentration and leverage. Higher debt with ownership concentration reduces managerial discretion. Further, ownership structure explains capital structure but not in vice versa.

Opposite to complementary is substitute perspective of institutional ownership and debt. Presence of institutional shareholders mitigates need of debt to discipline managers. Ross (1977) addresses that management use debt as a positive signal for outsiders about good performance of the firm. Firms with good expected financial performance may issue more debt due to better ability to repay it. On another side, institutional ownership also serves as a good signal to outside investors. Institutional investors directly monitor and discipline management and increase the value of the firm. Hence institutional ownership and debt are substitutes for each other.

Further, Short et al. (2002) say that attention should be paid to the relative cost of debt and equity while talking about the role of large external shareholders. It is more likely that large external shareholders engage management to invest debt in riskier investment options for their benefits. Debt holders are likely to include strict provisions in debt contracts that increase the cost of debt and might decrease firm's value. While active monitoring of management by large external shareholders reduces the cost of equity through disciplining management to take decisions in the best interest of shareholders. Thus the presence of large external shareholders may increase the cost of debt and decrease the cost of equity. Therefore there exists a negative relationship between large external shareholders and debt.

Hernández et al. (2016) used data from 2544 small and medium enterprises operating in Spain to figure out the relationship between ownership and capital structure. They address that how both interact to reduce agency problem. Being originated from Spain, this study has few considerable characteristics. Most of the small and medium enterprises have more concentrated ownership or are even family owned. The Spanish companies are operating in a relatively weak market-oriented economy. Spain is a country with weak investor protection. In presence of such characteristics, it is more likely that controlling big shareholders expropriate wealth from minority shareholders. This study focuses on agency cost arising due to principal-principal conflict. A System Generalized Moment Method used for estimation of results. Results show that the capital structure of SME's includes less debt especially when corporations are owners. Finally, ownership by family tends to increase debt in the capital structure of SME's for two reasons. First, debt structure is adapted to reduce agency cost. Second, family owners want to maintain their stake in the company.

### 3. Hypothesis Development

Review of literature given above leads us to the following propositions.

#### 3.1 Managerial Ownership

From portfolio theory point of view, as managerial ownership of a firm increases, non-diversified risk attached to non-human and human capital also increases. According to Friend and Lang (1988), one way to reduce non-diversified risk is to reduce the debt of firm. Brailsford et al. (2002) describe with an increase of debt, threat of financial distress and bankruptcy increases. Managers avoid financial distress and bankruptcy to avoid future impairment of credibility in manager market, loss of capital and job. But at a lower level of managerial ownership, it is plausible that non-diversified risk is low, managers would consider agency cost, positive signaling, and tax advantages related to debt. Complementary effect of both managerial ownership and debt is likely to hold.

Therefore, it is proposed that at a lower level of managerial ownership there exists positive relationship between managerial ownership and debt. However, when managerial ownership surpasses a point where managers become entrenched, they use their control over financial decisions of the firm. After that point as managerial ownership increases, non-diversified risk attached to human and non-human capital also increases. Managers pursue their own interests and reduce debt to avoid monitoring, the risk of financial distress and bankruptcy. Hence, it is plausible that when managerial ownership surpasses a low level, managers avoid debt.

Hypothesis 1: The relation between managerial ownership and debt is non-linear. It is positive for lower level and negative for higher level of managerial ownership.

#### 3.2 Institutional Ownership

Institutional shareholders have the capability and incentive to monitor managers' behavior and actions to reduce



managerial opportunism. Institutional shareholders are likely to have a more diversified portfolio as compared to managers and other shareholders. In this case, direct monitoring of each investment in the portfolio would increase overall monitoring cost of the portfolio. Therefore, it is plausible that institutional shareholders are more likely to use debt as a monitoring tool rather direct monitoring. From signaling theory point of view, institutional shareholding is a positive sign for creditors as it reduces managerial discretion and cost of debt. Additionally, tax advantage of debt make it more attractive. The increase of institutional ownership would increase the incentive to monitor. Hence, it is plausible to propose a positive relationship between institutional ownership and debt.  
 Hypothesis 2: Debt increases as institutional ownership increases.

#### 4. Methodology

The basic regression model is expressed as:

$$y_{it} = \alpha + \beta X_{it} + u_{it}$$

$$i = 1 \rightarrow N$$

$$t = 1 \rightarrow T$$

Where  $i$  stands for  $i$ th cross-sectional unit and  $t$  stands for  $t$ th time period,  $y_{it}$  is the performance measure for  $i$ th firm at time  $t$ , and  $\alpha$  is intercept.  $X_{it}$  is a  $1 \times K$  vector of observations on  $K$  explanatory variables for  $i$ th firm in the  $t$ th period,  $\beta$  is a  $K \times 1$  vector of parameters,  $u_{it}$  is a disturbance term and is defined as:

$$u_{it} = \mu_{it} + v_{it}$$

Where  $u_{it}$  denotes unobservable individual effects and  $v_{it}$  denotes remainder disturbance.

As per the scope of this study, variables have been taken from literature and defined fundamentally for comparison purpose. Debt ( $TDRTA_{it}$ ) is a dependent variable and represents firm debt structure, and it is measured as total liabilities to total assets ratio. Bathala et al. (1994) and Crutchley & Hansen (1989) used the same proxy. There are two independent or explanatory variables representing ownership structure namely Managerial Ownership ( $MNO_{it}$ ) and Institutional Ownership ( $INST_{it}$ ). Managerial ownership is a percentage of shares owned by insiders (managers, directors, executives, non-executives, family and friends) to total outstanding shares. Same proxy is used by Crutchley and Hansen (1989) and Bathala et al. (1994). Institutional ownership is a percentage of shares owned by institutions (both financial and non-financial) to total outstanding shares. Bathala et al. (1994) and Crutchley and Hansen (1989) also used same proxy for institutional ownership. There are four control variables namely Firm Size ( $SIZE_{it}$ ), Tangibility ( $TANG_{it}$ ), Profitability ( $ROE_{it}$ ) and Non-debt Tax Shield ( $NDTS_{it}$ ).

ROE represents profitability which is calculated by dividing normalized EBIT by shareholder equity. Firm Size is measured as the natural logarithm of total revenue as used by Titman & Wessels (1988). Tangibility (asset structure) is defined as the ratio of fixed assets to total assets. Crutchley and Hansen (1989) used the same definition of tangibility. Non-debt tax shield is measured as the ratio of depreciation and amortization expense to total assets.

##### 4.1 Data

Data is taken from the two largest economies, with USA representing the developed economies and China representing the developing economies. The middle segment of the market of each country is chosen for this study, segregated by market capitalization criterion.

Financial firms, utility providers, oil and gas exploration firms, broadcasting firms and hospitals are excluded from the study. Firms with missing historical information are also excluded from the study. Finally, data period from 2009 to 2016 is selected to provide the latest evidence on the selected topic. Following table presents the total number of firms included for analysis.

Table 1: Total medium-sized firms representing each country for analysis

Country	Total firms	Excluded	Included
USA	400	217	183
China	230	138	92
Total	630	355	275

Thomson Reuters Eikon database is used to collect data for selected variables. The data is cross-sectional as it is collected across firms over eight years. Data is unbalanced panel data because extreme values are selected randomly from a total number of observations to make data normally distributed.

##### 4.2 Estimation

Statistical technique ordinary least squares (OLS) is chosen to predict the relationship between dependent and independent variables. Criteria like a considerable amount of observations and linear relationship between dependent and independent variables suggest OLS for estimation of results. A sophisticated process is followed to check whether data is eligible for OLS and presented in next section.

Estimation of results involves two stages. At first stage, non-linear relationship between managerial

ownership and debt is measured. Managerial ownership and square of managerial ownership as independent variables are added to regression model with other control variables.

$$TDRTA_{it} = \beta_0 + \beta_1 MNO_{it} + \beta_2 MNOSQR_{it} + \beta_3 ROE_{it} + \beta_4 SIZE_{it} + \beta_5 TANG_{it} + \beta_6 NDTS_{it} + \varepsilon_{it} \quad (1)$$

At the second stage, the relationship between institutional ownership and debt will be estimated in presence of other control variables using following regression model.

$$TDRTA_{it} = \beta_0 + \beta_1 INST_{it} + \beta_2 ROE_{it} + \beta_3 SIZE_{it} + \beta_4 TANG_{it} + \beta_5 NDTS_{it} + \varepsilon_{it} \quad (2)$$

A total of 2106 observations are used for regression analysis (699 for Chinese firms and 1407 for USA firms). A multivariate regression with 6 independent variables for equation 1, 5 independent variables for equation 2 and 9 independent variables for equation 3 is trusted to provide fair variability of predictors to predict variability in the dependent variable

## 5. Empirical Results

Regression (OLS) analysis of each country is completed in two stages. At the first stage, regression model 1 estimates the relationship between managerial ownership (at low and high level) and debt. At the second stage, regression model 2 measures relationship between institutional ownership and debt.

### 5.1 Empirical Results of USA Firms

Table no. 2 presents descriptive statistics of all variables used in the regression for USA firms. It provides mean, standard deviation and number of observations for each variable.

Table 2: Descriptive statistics of variables for the USA firms

Variables	Mean	Std. Deviation	N
TDRTA	.52	.19	1407
MNO	.054	.094	1407
INST	.82	.16	1407
ROE	.26	.27	1407
SIZE	14	1	1407
TANG	.24	.2	1407
NDTS	.042	.04	1407

The average debt for sample firms of USA is 52% (Std. deviation = .19). It is interesting to see that average value of managerial ownership is below 20%. Managers own 5.4% (Std. deviation = .094) of total outstanding shares on average which indicates that in most firms managerial ownership is low. In sample firms, institutions own 82% (Std. deviation = .16) of outstanding shares on average. Profitability and tangibility of sample firms is 26% (Std. deviation = .27) and 24% (Std. deviation = .2) respectively on average. Average of the natural logarithm of total revenue (firm size) is 14 (Std. deviation = 1). Non-debt tax shield of sample USA firms is about 4.2% (Std. deviation = .04).

The following table presents correlation among variables. The strength of the correlation is assessed using the one-tailed test at 95% significance level ( $p < 0.05$ ).

Table 3: Pearson correlation matrix of variables for USA firms

	TDRTA	MNO	MNOSQR	INST	ROE	SIZE	TANG	NDTS
TDRTA	1							
MNO	-.239***	1						
MNOSQR	-.170***	.864***	1					
INST	.107***	-.462***	-.430***	1				
ROE	.368***	-.013	-.008	-.039*	1			
SIZE	.516***	-.198***	-.123***	.176***	.089***	1		
TANG	.075***	.077***	.020	.000	-.026	.087***	1	
NDTS	-.073***	.029	.006	-.008	.024	-.097***	.401***	1

\*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels respectively

Correlation between two variables around the value of .3 or -.3 should be considered as normal. But if correlation surpasses .7 or -.7 value limit then it is a serious case and one or more variables should be excluded from the equation. Some variables in the current study are scaled by total assets, therefore, correlation is expected among them. MNO and MNOSQR are significantly correlated to each other but it is ignored due nature of the study. The study analyzes the direction of the relationship between debt and low and high level of managerial ownership which is estimated in regression model 1. Finally, SIZE has a moderate correlation with

TDRTA. All other variables have normal significant or insignificant correlation with each other.

Further to check multi-collinearity problem, tolerance and variance inflation factors are calculated which indicate no serious multicollinearity.

### 5.1.1 Regression Results of Two Models

Following table presents results of both the models together.

Table 4: Regression results of the two models for the USA firms

Variables	Model 1		Model 2	
	Coefficient	Prob.	Coefficient	Prob.
Constant	.036	.517	-.105	.061
MNO	-.258	.000	-	-
MNOSQR	.117	.001	-	-
INST	-	-	.024	.192
ROE	.257	.000	.257	.000
SIZE	.237	.000	.275	.000
TANG	.039	.042	.017	.392
NDTS	-.129	.000	-.122	.000
<b>R<sup>2</sup></b>	.58		.56	
<b>Adjusted R<sup>2</sup></b>	.58		.55	
Stand. Error	.12		.12	
F-statistic	280 (.000)		295 (.000)	
Durbin Watson test	.596		.576	

The table depicts that Adjusted R2 of both the models is about 57% on average which means both models account for 57% of the variability in debt. F-statistic test the hypothesis that multiple R in population is equal to 0 that means used model cannot predict accurately the outcome. In both the models, F-statistic is significantly above 0 that means the models are statistically significant to predict an outcome that could represent the population. Thus multiple R is not equal to zero. Durbin-Watson test shows that the errors from both the multiple regressions are positively auto-correlated. Therefore, we pay attention to the sensitivity analysis of results from USA firms.

Model 1 predicts totally unexpected results. Standardized coefficient of MNO is negative while the standardized coefficient of MNOSQR is positive and both are significant at 5% significance level. Both coefficients are evidence against the hypothesized relationship of debt with the low and high level of managerial ownership. These results of major variables in model 1 are analyzed extensively in an upcoming sensitivity analysis to see if that is the real situation in sample data or it is a result of multicollinearity. In model 2, the standardized coefficient of INST is positive and insignificant. Hypothesis 2 is rejected due to the insignificance of results.

Standardized coefficient of size (t = 12.1) is positive and remained significant across all models. Large firms have large economies of scale, good reputation in the financial market and less probability of financial distress. Therefore large firms have more access to debt as compared to smaller firms. Findings are consistent with Michaels et al. (1999) and Fama and Jensen (1983). Non-debt tax (t = -6.7) shield is significantly related to debt. Results indicate that with an increase of non-debt tax shield, need for debt decreases. Findings are consistent with Ozkan (2001) and Bradley et al. (1984). Relationship of tangibility (t = 2.2) and debt is significant and positive in model 1 but insignificant in model 2. Finally, the relationship of profitability (t = 14.4) with debt is found significant and positive across both models. According to Jensen (1986), an effective market with effective corporate control forces firms to enjoy benefits of debt by increasing leverage in their capital structure. As a result, firms will perform effectively and generate more profits.

### 5.1.2 Sensitivity Analysis

Data used in the current study is unbalanced panel data over a period of eight years. Data can also be called pooled data, therefore, year wise observations may not be independent and multicollinearity among variables cannot be fully eliminated. Regression results of model 1 especially for confirmation of non-linear relationship of managerial ownership with debt are assessed using piece-wise OLS statistical technique. Managerial ownership is divided into high managerial ownership and low managerial ownership. According to Brailsford et al. (2002), managerial ownership equal to or beyond 20% is high managerial ownership while below than this point is low managerial ownership. In piece-wise OLS debt is regressed against high managerial ownership and low managerial ownership separately with same control variables to avoid any effect on each other. The table no. 5 presents results of both regressions together.

Table 5: Piece-wise OLS regression results for low and high managerial ownership for the USA firms

Variables	MNOLOW		MNOHIGH	
	Coefficient	Prob.	Coefficient	Prob.
Constant	.004	.947	.615	.017
MNOLOW	-.103	.000	-	-
MNOHIGH	-	-	-.172	.028
ROE	.329	.000	.240	.002
SIZE	.251	.000	.011	.896
TANG	.048	.012	-.096	.411
NDTS	-.241	.000	-.110	.338
R <sup>2</sup>	.57		.61	
Adjusted R <sup>2</sup>	.57		.58	
Stand. Error	.12		.10	
F-statistic	294 (.000)		21 (.000)	

Table no. 5 presents results of piece-wise OLS where debt is regressed separately using low and managerial ownership measures with four control variables. Adjusted R2 for both piece-wise regressions is well above 50% that means all models account for 50% of the variability in debt. F-statistic test the hypothesis that multiple R in population is equal to 0 that means used model cannot predict accurately the outcome. F-statistic is significantly above 0 that means both regressions statistically significant to predict an outcome that could represent the population. Thus multiple R is not equal to zero.

Standardized coefficients of both MNOLOW ( $t = -5.5$ ) and MNOHIGH ( $t = -2.43$ ) are found significant. Piece-wise regression analysis confirms that in a sample of USA firms relationship between managerial ownership and debt is negative both at low and high level. Findings are consistent with the construct that managers pursue their own interests and decrease the level of debt to avoid not only a controlling mechanism but also the risk associated with human and nonhuman capital.

Further to check if results for major variables in model 2 are sensitive to multicollinearity, SIZE is dropped out. When SIZE is dropped out from model 2 coefficients of both INST ( $t = 4.9$ ) and TANG ( $t = 5$ ) became significant. Institutional ownership is positively related to debt that means in USA complementary effect of both holds. Institutions prefer debt as a control mechanism for managers. Results are similar to Brailsford et al. (2002), Ganguli (2013). Firms with more fixed assets can use them as a collateral for debt hence more protection against debt provides more debt. Results of tangibility are consistent with Harris and Raviv (1991) and Rajan and Zingales (1995). Results of all other variables do not change.

### 5.2 Empirical Results of Chinese Firms

The table no. 6 presents descriptive statistics of all variables used in the current study for Chinese firms. It provides mean, standard deviation and number of observation of each variable.

Table 6: Descriptive statistics of variables for Chinese firms

Variables	Mean	Std. Deviation	N
TDRTA	.57	.18	699
MNO	.025	.07	699
INST	.11	.09	699
ROE	.15	.11	699
SIZE	14	1.6	699
TANG	.24	.2	699
NDTS	.019	.02	699

Average debt for selected Chinese firms is 57% (Std. deviation = .18). It is interesting to see that average value of managerial ownership is below the level of 20%. Managers own 2.5% (Std. deviation = .07) of total outstanding shares of mid-segment firms on average which indicates that in most firms managerial ownership is low. In sample firms institutions own 11% (Std. deviation = .09) of outstanding shares on average. Profitability and tangibility of sample firms is on average 15% (Std. deviation = .11) and 24% (Std. deviation = .20) respectively. Average of the natural logarithm of total revenue is 14 (Std. deviation = 1.6). Non-debt tax shield of Chinese firms sample is about 1.9% (Std. deviation = .02).

The next table presents correlation among variables. The strength of the correlation is assessed using the one-tailed test at 95% significance level ( $p < 0.05$ ).



Table 7: Pearson correlation matrix of variables for Chinese firms

	<b>TDRTA</b>	<b>MNO</b>	<b>MNOSQR</b>	<b>INST</b>	<b>ROE</b>	<b>SIZE</b>	<b>TANG</b>	<b>NDTS</b>
<b>TDRTA</b>	1							
<b>MNO</b>	-.108***	1						
<b>MNOSQR</b>	-.097***	.941***	1					
<b>INST</b>	-.104***	-.11***	-.103***	1				
<b>ROE</b>	.204***	-.07**	-.037	.202***	1			
<b>SIZE</b>	.359***	-.21***	-.104***	-.025	.180***	1		
<b>TANG</b>	-.209***	.036	.121***	-.208***	-.109***	.188***	1	
<b>NDTS</b>	-.163***	.038	.091***	-.129***	-.035	.148***	.793***	1

\*\*\*, \*\* and \* represent significance at the 1%, 5% and 10% levels respectively

Correlation between two variables around .3 or -.3 value should be considered as normal. But if correlation surpasses .7 or -.7 value limit then it is a serious case and one or more variables should be excluded from the equation. Few variables in the current study are scaled by total assets, therefore, correlation is expected among them. MNO and MNOSQR are significantly correlated to each other but it is ignored due to nature of the study. The study analyzes the direction of the relationship between debt and low and high level of managerial ownership which is estimated in regression model 1. TANG is highly correlated with NDTS. This correlation could influence results of all models, therefore, it should be considered in sensitivity analysis. Finally, all other control variables have normal significant or insignificant correlation to each other. Tolerance and variance inflation factors of all other variables are normal.

### 5.2.1 Regression Results of the Two Models

The following table presents results of both the models together.

Table 8: Regression results of two models for the Chinese firms

Variables	<b>Model 1</b>		<b>Model 2</b>	
	Coefficient	Prob.	Coefficient	Prob.
Constant	.365	.000	.412	.000
MNO	.187	.033	-	-
MNOSQR	-.214	.014	-	-
INST	-	-	-.107	.000
ROE	.119	.000	.132	.000
SIZE	.233	.000	.222	.000
TANG	-.321	.000	-.368	.000
NDTS	.017	.701	.032	.465
<b>R<sup>2</sup></b>	.50		.50	
<b>Adjusted R<sup>2</sup></b>	.50		.50	
Stand. Error	.13		.13	
F-statistic	98 (.000)		117 (.000)	
Durbin Watson test	1.912		1.852	

Table no. 8 presents results of model 1 and 2 where debt is regressed against ownership measures and control variables. Adjusted R2 of both the models is 50% that means both models account for 50% of the variability in debt. F-statistic test the hypothesis that multiple R in population is equal to 0 that means used model cannot predict accurately the outcome. In both models, F-statistic is significantly above 0 which means both models are statistically significant to predict an outcome that could represent the population. Thus multiple R is not equal to zero. Durbin-Watson test concludes that the errors from the model 1 are uncorrelated while the errors from the model 2 are positively auto-correlated.

In model 1, the standardized coefficient of MNO ( $t = 2.13$ ) is positive and standardized coefficient of MNOSQR ( $t = -2.4$ ) is negative as hypothesized in the current study. Both coefficients are significant therefore the relationship between managerial ownership and debt is non-linear. It is positive at a lower level and negative at a higher level of ownership. Results indicate both interest alignment and managerial entrenchment theorems hold. At a lower level of the managerial ownership, interest of managers and owners are aligned with each other and managers use debt to increase the value of the firm. On the other hand, as managerial ownership crosses the certain limit of low level, managers pursue their own interests and decrease the level of debt to avoid not only a controlling mechanism but also the risk associated with human and non-human capital. Results of the current study are consistent with Brailsford et al. (2002), Pindado and De La Torre (2011), Short et al. (2002) and Lundstun (2009).

In model 2, the standardized coefficient of INST is negative and significant ( $t = -3.8$ ). Regression predicts a negative relationship between institutional ownership and debt. The hypothesis related to institutional ownership and debt in the current study is rejected. Substitute perspective of debt and institutional ownership holds in

Chinese sample firms. Signaling theory supports the negative relationship between institutional ownership and debt. The results are consistent with Jensen and Meckling (1976), Short et al. (2002) and Ross (1977).

To see if results of major variables in both models are sensitive to other variables, we drop out or include them one by one. The sensitivity analysis of both the models indicates no major change in results that confirm the robustness of regression results.

## 6. Discussion of Results

The capital structure of a firm is not merely influenced by firm-specific factors. It is also influenced by industry and country-specific factors. As discussed earlier, quality and sophistication of capital markets and institutions affect production and investment decisions of individuals and organizations. Big market size provides an opportunity to serve the big market and enjoy economies of scale. Further, tax law, shareholder protection law, control ownership of firm and financial systems are some important factors to mention.

Discussion on the results of this study wouldn't be completely meaningful unless they are viewed simultaneously with the country-specific characteristics in the background. If we look at the mean values in the descriptive statistics, Chinese mid-segment firms use 57% debt on average, meaning that more than 50% of total assets are financed by debt on average. On the other hand, USA mid-segment firms use 52% debt on average, which means that in USA the percentage of assets financed by debt on average among the medium sized firms is less than that in China. Growing firms need more resources to serve big markets. Big markets could not be served without achieving economies of scale that again emphasizes the need of resources. Further, emerging countries have less saturated markets that provide more growth opportunities to medium-sized firms as compared to developed countries. China is an economy with less developed and less liquid financial markets as compared to the USA. It is quite clear that the sample developing economy is relying more on debt as compared to developed economy of USA.

Mean of managerial share ownership in both the Chinese and USA firms is quite low. It is 2.5% for Chinese and 5.4% for USA firms. If we compare institutional ownership between two countries, we see that it differs significantly. USA mid-sized firms have much higher institutional ownership which is 82%. China on the other hand has much lower institutional ownership which is 32%.

Larger shareholders may not be able to trade their equity in less liquid markets while in more liquid markets they can trade the equity easily. Further, if mid-sized firms are less widely held then it is more likely that they are more controlled by families, institutions or corporations in developing countries as compared to developed countries. It is clear from above data that managerial and institutional shareholdings collectively in mid-sized firms of developing countries are far less than mid-sized firms in developed countries. The argument is plausible that may be mid-sized firms in developing countries are controlled by families or corporations and if such is the case, major control over financial decision would stay with them. On the other hand, institutional ownership in mid-sized firms is quite high in developed countries because they are operating in economies where shareholder protection, corporate governance and enforcement of the law are strong.

Further, two propositions could also explain the higher level of debt with a lower level of managerial and institutional ownership in medium-sized firms of developing countries. Either, the controlling shareholders are trying to expropriate wealth from minority shareholders and debt providers or they are trying to reduce agency costs and maintain their stake in the firms.

Moving on to the regression analysis in model 1, the relationship of low managerial ownership with debt is positive in China and negative in the USA. Relationship of the square of managerial ownership with debt is negative and significant across both the sample countries. The first hypothesis of the current study is not rejected for the Chinese firms while it is rejected for USA firms. These results are consistent with portfolio, tradeoff, interest alignment, and managerial entrenchment theories. At the low level of managerial ownership non-diversified risk attached to human and non-human capital for managers is low. Managers intend to lower agency cost, send a positive signal to the market about managerial commitment and consider tax advantages of debt. Interests of owners and managers are aligned with low managerial ownership. Managers would bear debt up to a certain limit. But as soon as managerial ownership crosses low level its relationship with debt turns opposite. Beyond low level, with an increase in managerial ownership non-diversified risk attached to human and non-human capital increases and managers intend to avoid debt. Further at high managerial ownership when managers become entrenched they make financial decisions in their own favor.

In USA medium-sized firms, the relationship between debt and managerial ownership is negative for both low and high level. It is quite clear that with such a dominant institutional ownership of medium-sized firms in the USA managers tend to avoid debt even at low level.

Model 2 of the study is regarding the relationship between debt and institutional ownership, and the regression analysis shows that the relationship between debt and institutional ownership is negative and significant for China, and positive and significant for USA. Negative relationship indicates that institutional owners of mid-sized firms may not have diversified portfolios, therefore they might prefer direct monitoring

instead of using debt as a tool. The result is inconsistent with our hypothesis and supported by agency theory that debt and institutional ownership both serve the same purpose of disciplining managers; hence both are alternative to each other. Moreover, it is highly likely that managers are not in control of most of the sample medium-sized firms.

In USA, institutional ownership is very dominant in mid-sized firms. It seems that institutions have a very diversified portfolio and they avoid direct monitoring cost. Institutions prefer debt as a disciplinary and monitoring tool for managers as hypothesized in the current study. Further signaling theory supports this positive relationship and advocates that institutional ownership of a firm sends a positive signal about its performance and discipline. Therefore, the cost of debt decreases and proportion of debt in capital structure increases with the increase of institutional ownership. Both play a complementary role. Similar results are found by Brailsford et al. (2002) and Ganguli (2013).

Results confirm that with an increase in managerial ownership, managerial voting rights, their power to influence financial decision and control over firm increases. Managerial entrenchment overweighs the monitoring effect of institutional shareholders.

## 7. Conclusion

This study provides an opportunity to understand the determination of firm debt structure from a firm ownership perspective. It is an effort to figure out the relationship of debt with managerial ownership and institutional ownership in the context of developed and developing countries together, represented by sample data from USA and China respectively.

It is found that the relationship of debt with low managerial ownership is positive for China while negative for the USA. Relationship of debt with high managerial ownership is found negative for both China and USA. Overall, results are consistent with trade-off, portfolio, interest alignment and managerial entrenchment theories. In USA managers of medium-sized firms avoid debt at all levels of managerial ownership, possibly because of high levels of institutional ownership. Interestingly, the relationship of debt with institutional ownership is negative for China but positive for the USA. Institutional owners of mid-sized firms in USA have more diversified portfolios. They prefer debt as a controlling mechanism to reduce managerial opportunism.

The relationship of debt with low managerial ownership is measured in the presence of institutional ownership, while the relationship of debt with institutional ownership is measured in the presence of high managerial ownership. When low managerial ownership and institutional ownership do not complement each other, it is worth noting that the strong relationship between debt and the low level of managerial ownership exists even in the presence of institutional ownership for USA firms. On the other hand, no relationship exists between debt and the low level of managerial ownership in the presence of institutional ownership Chinese and UK.

Finally, it is found that relationship of debt with institutional ownership weakens in presence of high managerial ownership in both China and USA. Results confirm that increase of high managerial ownership increases voting rights, the power to influence financial decision and control of managers. Managerial entrenchment overweighs the monitoring effect of institutional shareholders.

In future research, other measures of ownership should be included to see a clearer picture of results. It is recommended to devise proxies of control variables such that it eliminates multicollinearity problem as much as possible. This study can further be extended to include more countries representing developed and developing groups.

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