

How Leverage Affects Agency Cost: Investigating a Non-linear relationship in Pakistani Firms

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Abstract

This study tests the agency cost hypothesis that use of debt decreases agency cost. This relationship has been tested using data of 265 non-financial companies listed on Karachi stock exchange during the period of 2004-2009. Assets utilization and General & Administrative expense ratio are used as proxy to measure agency cost. As suggested by Jensen and Meckling (1976) that relationship between leverage and agency cost may not be monotonic and excessive high leverage may have positive effect on agency cost. To test this possibility non-linear regression model has also been included. We find evidence in support of agency cost hypothesis. Results show that total debt reduces agency cost. We also find some evidence of non-linear relationship between total debt and agency cost. In Pakistan non-financial companies at total debt ratio of above 60% the diminishing effect of leverage on agency cost starts to diminish and regression results give some evidence that further increase in leverage increases total agency cost. This study also provides implication for the debt holders as well as the policy makers on the use of debt in total financing of a firm.

Keywords: Agency cost, leverage, non-financial firms, non-linear relationship

1. INTRODUCTION

In a firm which is owned and managed by a single person, no agency problem exists because there is no conflict of interests. In such a firm, manager will make decisions that maximize firm's value because manager himself is the entitled to the value generated by business. But when business is not totally owned by its managers, as in publicly held large corporation, there exists agency problem due to separation of control and ownership. The managers of a company act as agent of shareholders. The Shareholders of a company appoint managers to run business on their behalf. Managers have their own incentive such enjoying perquisites and maximizing their wealth (Grossman and Hart, 1982) even at the expense of shareholders' value. As manager's ownership claim falls, his incentive to create value of firm decreases (Jensen and Meckling 1976; Ang et al. 2000), which gives rise to the agency conflict as the goals of owners and managers become divergent.

Now, question exists that how shareholders (owners) can make managers to act in their best interest? How interest of shareholders and managers can be aligned? There are different ways in which this agency problem can be reduced. These methods include: first, increasing managerial ownership as increased managerial ownership helps to align shareholder's and managers' interest (Ang et al., 2000; Fleming et al, 2005). Second, the role of ownership concentration in reducing agency cost. Large shareholders have more power to control and align the interest of managers and shareholders (Jensen

and Meckling, 1976). Third is the use of debt to commit managers and reduce agency cost (Grossman and Hart, 1982; Williams, 1987). According to agency theory, the higher debt ratio decreases agency cost of equity by aligning the interests of managers and shareholders. The purpose of this study is to test agency cost hypothesis that states that use of debt can reduce agency.

1.1 ROLE OF DEBT IN CAPITAL STRUCTURE:

The Role of debt in capital structure has been widely studied in the corporate finance. In 1958, two professors Franco Modigliani and Merton Miller explored the new horizon of corporate finance. In their article Modigliani and Miller (1958) demonstrated that financial leverage has no effect on the value of a firm. The theory proposed by Modigliani and Miller was based on some stringent assumptions such as no effect of taxes, absence of bankruptcy costs, information symmetry, no transaction cost. But these assumptions do not hold in real world. In 1963, Modigliani and Miller demonstrated the effect of tax on firm capital structure and proposed that a firm should use maximum amount of debt to increase its tax shield. They argued that due to favorable treatment of interest payments, a firm should use maximum amount of debt. However, this theory did not consider the bankruptcy costs associated with debt, but companies do face bankruptcy costs in real world and these costs can be very high.

As debt level in capital structure increases this also increases the cost of financial distress. Financial distress is a situation when a firm is not able to honor its obligations. Financial distress cost includes both bankruptcy and non-bankruptcy costs. The tradeoff theory of capital structure considers the both potential benefits and costs of using debt. According to trade off theory, optimum capital structure is one that balances the benefit of tax shield from interest, agency benefits and the cost of debt i.e. bankruptcy cost and agency cost. Therefore, the firm that wants to maximize its value will focus on offsetting benefits of debt with cost of using debt. According to static trade off theory, the target debt ratio might be identified by tradeoff between benefits and cost of debt of a single period. Second model is dynamic trade-off model, according to which the target debt ratio changes with change in benefits and cost of debt over time. As managers of Company are the agents of the shareholders of the company. They have responsibility to manage business for the benefit of shareholders. As identify by Jensen and Meckling (1976), this agency relationship between managers and owners can create agency problem. As managers are mainly interested in safeguarding their own interests like higher salaries, job security and enjoy other perquisites. According to agency theory, debt can be used as a tool to control agency conflict between shareholders and managers.

1.2 DEBT AND AGENCY COST:

The use of debt impacts agency cost in several ways. First, the use of debt reduces the free cash flow available to managers (Jensen, 1986, Stulz, 1990), as promised interest payments to debt holders decrease free cash flow available for investment. This decrease in free cash flow also helps in curtailing overinvestment problem (Harvey et al., 2004; D'Mello and Miranda, 2010). Second, use of debt can increase monitoring of managers by debt holders like bank, which put pressure on managers to run business profitable (Ang, et al., 2000). Third, by increasing the threat of bankruptcy because in case of bankruptcy managers will lose benefits which they get from firm (Grossman and Hart, 1958; Williams, 1987).

Free cash flow is the excess of cash that is required to fund all positive NPV projects (Jensen 1986). Managers have discretion to use free cash flow and this creates potential agency conflict. Managers can use free cash flow for enjoying perquisites or invest this free cash flow to increase resources under their control for empire building (Jensen, 1986; Stulz, 1990). This empire building would allow managers to create higher salaries and would offer greater power to them. This investment by managers creates overinvestment problem. Overinvestment refers to a situation in which managers invest in too many projects even when projects don't benefit shareholders. This conflict created by free cash flow can be controlled by using debt in capital structure. By issuing debt, the managers of firm are obliged to make periodic payments of interests and principal. These periodic payments reduce amount of free cash flow available for use by managers and hence reduces agency conflict between owner and managers.

The use of debt also increases monitoring of managers' activities. As creditors have incentive to monitor to performance of the enterprise (Jensen and Meckling 1976) to ensure the payment of interest and principal. Banks, which are the major source of financing, play very important role in optimizing the monitoring of managers. Large debt holders also have contractual right to monitor activities of manager. This monitoring by creditors also helps owners in monitoring managers and reduces cost of monitoring managers by owners. The other effect which is created by debt is the threat of bankruptcy. The threat of bankruptcy forces managers to run business in profitable manner. The creditors have legal right to take a firm to court if it fails to honor the claims of creditors. This creates threat for managers of losing their jobs in the event of liquidation of the firm. The threat of losing jobs put pressure on managers to run business profitably and stops them from exploiting the resources of business. The use of debt limits the tendency of managers to use firm's resources inefficiently. In this way debt helps in disciplining manager and forces them to pursue business value maximizing goals. In summary the use of debt helps in reducing agency cost in many ways and this reduction on agency cost leads to overall higher firm value.

1.3 AGENCY COST OF DEBT:

The use of debt also have agency cost associated with it. Jensen and Meckling (1976) pointed out another agency problem that arises due to conflict of debtors and shareholders. As use of debt in financial structure increases, it aggravates agency problem between shareholders and debt holders. The agency costs associated with excessive increased leverage include direct wealth transfer (Smith and Warner 1979), the asset substitution problem (Jensen and Meckling 1976), and underinvestment problem (Myres 1977).

The wealth transfer conflict arises when dividend of shareholders are increased or when firm issues high priority debt (Smith and Warner 1979). If a firm issues new debt which is senior to existing debt, the value of existing debt will decrease as larger number of debt holders will have claim on assets and cash flow of firm. The asset substitution problem occurs because in case of high leverage, the shareholders have strong incentive to invest money in projects with high pay-off even when probability of success is slim. As debt holders are only entitled to fixed payment, they will not be able to benefit from such highly risky projects. In case of success shareholders will rip off most of benefit. However, in case of failure of project, the creditors will bear most risk. Debt holders may restrict shareholders to invest in such highly risky but rewarding projects (Kalcheva and Lins 2007). This aggregates debt-equity holders' agency conflict. The Excess use of debt can create under-investment problem in firms which have high growth opportunities. The shareholders of company may refuse to invest in low-risk projects. Low risk projects provide more security to debt holders but such projects don't generate excess cash flows for share holders. The other problems that are associated with the excessive use of debt is that it increases the cost of bankruptcy cost (Jensen 1986; Titman 1984) and managers may use excess cash generated from debt issue to increase resources under their control (*empire building phenomena*) (Jensen 1986). Although, according to agency cost hypothesis the increase in leverage reduces agency cost of equity by aligning interests of shareholders and managers. But as identified by Jensen and Meckling (1976) by this negative relationship between leverage and agency may become positive at higher level of leverage. As increase in leverage also increases costs associated with the use of debt, at higher level of leverage further increase in debt may increase total agency cost.

1.4 OBJECTIVE OF STUDY:

The first objective of this study is to test the effect of change in capital structure on agency cost by using data of Pakistani non-financial sector firms. The present study is expected to contribute significantly in the corporate finance literature in general and for Pakistan in particular. Moreover, this study is also expected to provide some fruitful guidelines for debt financiers as well as or the policy makers of capital markets in Pakistan to look into the role of debt for long term value creation of firms by having optimal level of debt in total financing of Pakistani firms. The reason of exclusion of financial firm for sample is that financial sector is highly regulated and there are many restrictions on its capital structure. Another objective of this research is to test the possibility that at high level of debt whether original negative relationship between leverage and agency cost holds or it reverses. Because at high level of leverage the agency cost of debt may overcome that of equity and further increase in

debt level may increase total agency cost. The last objective of this study is to identify the threshold level at which this negative relationship becomes positive.

2. LITERATURE REVIEW

In their study, Jensen and Meckling (1976) pointed out that agency cost arising out due to separation of ownership and control, whereby managers have incentive to maximize their own utility or using firm's resources for personal benefits rather than maximizing value of firm. They identify two types of agency cost: agency cost due to conflict of interest between shareholders and managers and agency cost arising out from conflict of interest of shareholders and debt holders. According to Jensen and Meckling (1976) agency cost is the sum of Monitoring expenditure, bonding expenditure and residual loss. Grossman and Hart (1982), with assumption that management has control of financial structure, showed how threat of bankruptcy can bring incentives to improve management. They argue that managers of equity financed firm don't have incentives to maximize profit in particular due to absence of threat of bankruptcy and they may use debt to commit themselves and signal the market that they will peruse profits rather than wasting organizational resources for their perquisites. The threat of bankruptcy will put more pressure on managers if bankruptcy results in loss of perquisites that they enjoy.

Jensen (1986) suggested how debt servicing helps in disciplining managers by reducing amount of free cash flow. Jensen (1986) defines free cash flow as "*cash flow in excess of that is required to fund all projects that have positive net present value when discounted at relevant cost of capital*". According to Jensen (1986), managers may overinvest and expand firm's resources above optimal level. By overinvesting in business managers increases resources under their control for empire building. As firm grow in size managers power increases and managers have more opportunities to enjoy perquisites. The managers with excessive cash flow have option of either paying out cash as dividend or retaining cash in business for investing them in low-return projects. This situation creates conflict between managers and shareholders. According to Jensen this conflict can be manage by issuing debt. The issue of debt helps in reducing free cash flow as promised regular payments has to be made to debt holder. Debt issuance also gives right to debt-holders to take firm to court for bankruptcy if managers don't maintain their promise. This prevents managers from investing in low-return projects or wasting it.

Similarly, Stulz (1990) developed theoretical model to investigate how financing policies can be used to manage agency problem of manager control on free cash flow in the presence of information asymmetry. In a firm with excessive cash flow and poor investment opportunities, manager have incentive to invest even in negative NPV projects because perquisites increase with firm size. He demonstrated in his model that debt can be used to counter overinvestment problem by bonding managers to pay out excess cash to debt holders. The debt can also create problem of underinvestment when firm has good opportunities to invest in positive NPV projects. Hence, debt impact shareholders wealth both positively and negatively. Haris and Raviv (1990) presented theoretical model to investigate the ability of debt to allow investors to gather information useful for monitoring management and allows investors to discipline managers. They argue that manager wants to continue operations of firm even if liquidation is in the interest of investors. That's why managers are reluctant to provide detailed information that could result in liquidation. As debt holders have legal rights, they force managers to provide detail information. This information is also helpful for investors to monitor activities of managers.

Ang. et al., (2000), by using data of small business, studied the effect of ownership structure on agency cost. They demonstrated that agency cost decreases with external monitoring by banks. This puts pressure on managers to run business profitability and report the real picture of business to such financial institution investors. This monitoring by banks also reduces the owner-manager agency cost. In a study on 211 non-financial Chinese listed firms by LI and Cui (2003), using annual sales to total asset and return on equity ratios as proxy to measure agency cost, proved that higher debt to asset ratio results in higher annual sale to total asset and return on equity ratio. Thus, proving that there is negative relationship between leverage and agency cost. Havery et al. (2004); investigated the effect of leverage on governance using data from 18 emerging markets. Their study shows that international debt

contracts have strong monitoring effect due to stringent disclosure terms and offer more creditors rights. This monitoring effect also discourages self-interested managers from exploiting share holders. The benefits of using debt is more pounced in firm that most likely to have overinvestment problems and few growth opportunities. Fleming et al (2005) replicated the study of Ang. et al. (2000) by using sample data of Australian SMEs. They use asset utilization ratio and operating expense ratio as proxy for agency cost. They test relationship between debt to equity ratio, used as proxy for banks' monitoring, and equity agency cost. Results show that leverage improves asset utilization but results show no significance impact on discretionary operating expenses.

Berger and Bonaccorsi di patti (2006), tested that effect of leverage on firm performance. By using data of US banking industry, their results were consistent with the agency cost hypothesis that increase leverage may reduce agency cost but results did not show any significant proof that excessive increase in leverage may increase agency cost. Their result also showed that large institutional holding may reduce agency cost due to effective monitoring. Kale et al (2007) by using panel data of publicly held corporations analyzed the relationship between leverage and employee productivity to investigate the disciplining role of debt. Their results show that productivity is positivity related with leverage at lower level of leverage but this relationship becomes negative when leverage becomes sufficiently high. According to them the reason of this negative relation is that at sufficient high level of debt the cost of financial distress becomes large enough that forces employees to look for another job and employees lower their efforts of productivity. Their results also show that when outside employment opportunities are greater the relationship between leverage and employee productivity is weaker but when outside employment opportunities are fewer the relationship becomes significantly stronger.

Zhang and Li (2008), explored the impact of leverage on agency cost for 323 UK firms. Using multivariate and univariate, their results confirm that agency cost is negatively related to leverage. However, when capital structure is also composed of sufficient high level of leverage, results of univariate analysis also showed opposite (positive) but non-significant relationship between leverage and agency cost. Finally, no significant evidence was found from testing whether the effect of leverage on agency costs becomes stronger when the differences of leverages of firms at different leveraged stages getting larger. D'Mello and Miranda (2010), by using a sample of 366 new debt issues by unleveraged firm in the US over the period of 1968-2001, investigated the influence of long-term debt on overinvestment debt issue. Their findings suggest that when firms are unleveraged, they have surplus liquidity reserves and that new debt issue leads to dramatic reduction in liquidity ratio. This relationship is stronger for firm having poor investment opportunities. The reduction in surplus cash is significantly related to the debt interest payments. According to them managers of unleveraged firm retains excessive amount of cash.

Margaritis and Psillaki (2010) examined the relationship between capital structure, ownership structure and firm performance. By using firm's production efficiency as indicator of agency conflict, investigate the effect of financial leverage on agency conflict in firms. Their reported that higher leverage results in improved firm performance. Moreover, results also support the theoretical predictions of Jensen (1986) and Stulz (1990) that the effect of debt on production efficiency is stronger for industries with less growth opportunities. Hua et al (2010) studied the effect of level of debt financing on agency cost of equity by using sample financial of data of non-financial companies listed on Shanghai and Shenzhen stock exchange during the period of 2007-2009. Their results were consistent with the hypothesis that debt financing can reduce agency cost of equity. They find significant relation between leverage ratio and administrative expense ratio and total asset ratio. According to their findings, there is negative relation between debt-to-asset ratio and administrative expense ratio, and positive relationship between debt-asset-ratio and total asset turnover.

Fatma and Chichti (2011), using three-stage least square simultaneous equations model approach, examined the impact of debt policy and ownership structure on agency problem arising due to overinvestment problem. By using sample data of 35 non-financial Tunisian listed companies during the period from 1999 to 2008, their results reported significant negative relationship between leverage and free cash flow. This negative relationship shows that overinvestment problem can be reduced by issuing debt. Mushtapha and Ahmad (2011) studied the effect of debt financing of an organization on

its monitoring cost in Malaysian organization. Their findings showed that as debt increases the monitoring cost of organization decreases because managers are more vigilant as the result of monitoring by banks. Moreover, as debt financing increases the cost of external audit increases as compare to internal audit. This finding suggests that lenders require an independent third to verify the financial to ensure that management is following debt covenant.

A number of other researchers have studied the effect of other factors that may reduce agency cost. Jensen and Meckling (1976) argue that large shareholders reduces agency cost by aligning managers' and shareholders' interest, as large shareholders are more motivated and have more power. Similarly, Shleifer and Vishny (1986), show that large shareholders can mitigate agency problem as they have incentive to monitor and discipline managers. However, Nekhili et al. (2009), using sample of 124 French firms, show that ownership concentration increases the agency cost of free cash flow. Ang. et al., (2000) by using data of small business, demonstrated that agency cost increases with increase in non-managers owners. The agency cost is higher when an outsider manages the firm, and is negatively related to the manager's share in ownership. Singh and Davidson (2003) extended the research of Ang et al. (2000) to larger American corporations. Using asset utilization and discretionary expense ratio as proxy measure for agency cost, their results showed that inside ownership reduces agency cost when asset utilization is used but relationship is not significant when discretionary expense ratio is used.

In light of above discussion and literature we can conclude that at low level of leverage, further increase in leverage will reduce agency cost by reducing free cash flow available to managers (Jensen, 1986, Stulz, 1990), increased monitoring of managers by debt holders (Ang. et al., 2000), and increased threat of bankruptcy (Grossman and Hart, 1958; Williams, 1987). However the relationship between leverage and total agency cost could not be monotonic (Jensen and Meckling 1976). When leverage ratio reaches a certain point then further increase in leverage may result is higher total agency cost because of increasing agency cost of debt, increased bankruptcy costs and ineffective use of cash by managers. Jensen (1986) argued that the optimal structure is one where marginal costs of debt offset the marginal benefits of debt. Therefore, at low level of leverage, increase in leverage will reduce agency cost between shareholders and managers by curtailing overinvestment, decreasing free cash flow and increase monitoring by debt holders.

Following above discussion and literature review, we will test following hypothesis:

H₁: There is a negative relationship between leverage and agency cost

H₂: There is a positive relation between leverage and agency cost at high level of leverage.

3. DATA AND METHODOLOGY

3.1 SOURCE OF DATA:

This research is based on data from financial analysis of non-financial companies listed on Karachi Stock Exchange (KSE) issued by Statistics and Data Warehouse Department of State Bank of Pakistan (SBP). This publication provides the financial data of 414 non-financial companies from 2004 to 2009.

3.2 SAMPLE:

We have used annual financial data of companies form 2004-2009 for analysis. For sample selection we have excluded companies whose complete data for 2004-2009 were not available. Similarly companies with negative equity and having duplicated data in SBP financial analysis report have been excluded from sample. Year 2010 has been excluded from analysis due to change in format of analysis report on non-financial sector by SBP.

Table 1 gives sector wise classification of initial sample included in this study. The textile sector is the largest non-financial sector in Pakistan and accounts for approximately 40% of non-financial companies listed of Karachi Stock exchange that's why it has highest percentage in our sample. A total

of 1590 cross sectional sample observation for 265 companies from year 2004 to 2009 were collected as final sample. The study sample is balanced and total 265 observations per year were collected.

Table 1: Sector wise Classification of No. of samples Companies included in Study

Sector	No of Companies	Percent	Cumulative %age
Textile	99	37.36%	37.36%
Chemical	31	11.70%	49.06%
Engineering	30	11.32%	60.38%
Sugar	24	9.06%	69.43%
Paper&Board	7	2.64%	72.08%
Cement	16	6.04%	78.11%
Fuel&Energy	16	6.04%	84.15%
Transport&Communication	3	1.13%	85.28%
Misc.	39	14.72%	100.00%
Total	265	100.00%	

3.3 VARIABLES OF STUDY:

Total seven variables will be used in this study, two dependent variables, one independent variable and four control variables. Table 2 gives measurement of all the variables used in this study:

3.3.1 DEPENDENT VARIABLE:

This study has used two proxy measure of agency cost. Following Ang. et al (2000), Singh and Davidson (2003) and Fleming et al (2005), our first measure of agency cost is asset utilization ratio. This ratio measures how much efficiently managers employ company's assets. The asset utilization ratio is define as *total sales* divided by *total assets*, high asset utilization shows high amount of sales and cash generated for every given level of asset and indicates effective investment decision and productive use of assets by management. While high asset utilization shows value creation for shareholders, a low asset utilization ratio gives indication of non-optimal investment decisions and unproductive use of assets. Therefore firms with high asset utilization will has less agency conflict as compare to firms having low asset utilization ratio.

Table 2: Definition of Variables Used in Study

VARIABLES	DEFINITION
DEPENDENT VARIABLES	
Asset Utilization ratio (AU)	This ratio is calculated as total sales divided by total assets.
General and Administrative expense to Sales ratio (GATS)	This ratio is calculated as total General & Administrative expenses divided by total sales . General and Administrative expenses consist of the Administrative & other expenses and selling & distribution expenses
INDEPENDENT VARIABLES	
Total Debt to Total Asset ratio (TDTA)	This is calculated as total Liabilities (Short term + Long term) divided by total assets.

CONTROL VARIABLES

Performance (ROA)	Return on asset will be used as proxy for performance. This ratio is calculated as net income divided by total assets.
Size	Natural log of total asset. This is used as proxy to control size of firm.
Growth	This is defined as Total sales of current period minus total sales of previous period divided by last year sales.
Industry dummy variables (DUM)	8 industry dummy variables are used

Following Singh and Davidson (2003), second measure of agency cost that has been used in this study is the ratio of general and administrative expense to sales ratio as a measure of managerial agency conflict arising due to excessive spending on perquisites. General and administrative expenses consist of the administrative & other expenses and selling & distribution expenses. These expenses tend to capture management's discretion in spending company's resources on excessive perquisites. Administrative & other expense are non-production costs. These include postage, telegram and telephone expenses, conveyance and travelling expenses, salary, wages and other benefits, depreciation expenses. Selling and distribution expenses are also non-production cost, but directly related with the revenue generation of saleable goods. These costs include distribution expenses, brokerage expenses, Salary, wages and commission expenses, discount expenses, selling expenses, forwarding expenses. Management may also use selling and distribution expenses to conceal their expenditure on perquisites. Therefore higher spending on these expenses would reflect higher agency conflict.

3.3.2 INDEPENDENT VARIABLE:

To measure leverage, debt to asset ratio has been used. Debt to asset ratio is defined as ratio of *total liabilities* (short-term + long-term) divided by *total assets*. Employees' gratuity fund and deferred liabilities have been excluded from total liabilities to calculate debt ratio. High debt to asset ratio should result in low agency costs due to decreased free cash flow and increased monitoring effect by creditors. We expect positive relation between leverage ratio and asset utilization ratio, as high asset utilization indicates less agency conflict. Expected relationship between Leverage and General & Administrative expense ratio is negative, as higher General & Administrative expense ratio represents higher agency conflict.

3.3.3 CONTROL VARIABLES:

In order to control the potential effect of other variables on agency cost, four control variables have been used in this study. First, to control effect of performance, return on assets ratio has used. Return in assets is defined as *operating profit* divide by *total assets*. We have used operation profit instead of net income to minimize difference in the financial costs and taxation of companies. Second, to control effect of size on dependent variables natural log of total assets has been used. Third to control potential effect of growth on our dependent variables, we have used percentage growth in sales of a company. Last control variable that has been used is dummy variable, as ratios of asset utilization and expense to sales would be different across industries because of each industry individual characteristic.

We expect size of company to be negatively related to general and administrative expense to sale ratio due to economics of scale effect and positively related to asset utilization ratio, as larger firms are more efficient in utilizing assets. The expected relationship between return on asset and general & administrative expense ratio and asset utilization is negative and positive respectively. Similarly, we expect growth in sales to be positively related with asset utilization ratio and expense ratio as firms experiencing growth in sales will utilize assets more efficiently and will have higher ratio of general and administrative expenses to sales because of growth in firms' business.

3.4 MODELS

Multivariate regression analysis has been conducted on panel and pooled data of sample firms to investigate the relationship between independent variables and two proxy dependent variables used to measure agency cost including three control variables will be used.

3.4.1 LINEAR REGRESSION:

To test the linear relationship between agency cost on leverage and other control variables, the following regression models have been proposed.

$$\begin{aligned}
 AU_{it} &= \alpha + \beta_1 TDTA_{it} + \beta_2 ROA_{it} + \beta_3 SIZE_{it} + \beta_4 Growth_{it} + \sum_{k=1}^8 \gamma_k DUM_k + e_{it} \\
 GATS_{it} &= \alpha + \beta_1 TDTA_{it} + \beta_2 ROA_{it} + \beta_3 SIZE_{it} + \beta_4 Growth_{it} + \sum_{k=1}^8 \gamma_k DUM_k + e_{it}
 \end{aligned}$$

Where α is the intercept term, $\beta_1, \beta_2, \beta_3, \beta_4$ and γ_k are the coefficient and e_{it} is the error term.

3.4.2 NON-LINEAR REGRESSION TESTS:

According to Jensen and Meckling (1976), possibilities exists that at excessive high leverage the effect of leverage on agency cost may reverses and becomes positive. To test this non-monotonic relationship between leverage and agency costs we have use following non-linear regression models.

$$\begin{aligned}
 AU_{it} &= \alpha + \beta_1 TDTA_{it} + \beta_2 TDTA_{it}^2 + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \beta_5 Growth_{it} + \sum_{k=1}^8 \gamma_k DUM_k + e_{it} \\
 GATS_{it} &= \alpha + \beta_1 TDTA_{it} + \beta_2 TDTA_{it}^2 + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \beta_5 Growth_{it} + \sum_{k=1}^8 \gamma_k DUM_k + e_{it}
 \end{aligned}$$

Where α is the intercept term, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and γ_k are the coefficient and e_{it} is the error term.

To identify the threshold point at which controlling effect of leverage on agency cost starts to diminish due to increasing agency cost of debt and bankruptcy costs, we have used portfolio analysis by dividing panel data into five groups on the basis of TDTA ratio. At each level linear regression model was used to see the impact of different leverage ratio on agency cost.

4. EMPIRICAL RESULTS AND DISCUSSION:

4.1 DESCRIPTIVE STATISTICS:

The overall descriptive statistics for the sample of 265 Pakistan non-financial companies for period of 2004-2009 are presents in Table 3. The AU ratio has mean value of 1.27 with median of 1.06. It ranges from .0031 to 20.89 having dispersion of 1.20. Similarly GATS ratio has mean value of .09 with standard deviation of .39. It ranges from minimum of .0038 to maximum of 13.67. The mean value of total debt ratio is .58, which varies from minimum of .013 to maximum of .99. The average ROA of sample companies is 9.94% which ranges from minimum of 28.27% to maximum of 77.78%. All the variables used have positive skewness expect SDTA and TDTA.

Table 3: Overall descriptive statistics of sample (N = 1590)

	Mean	Median	Std. Deviation	Skewness	Kurtosis	Minimum	Maximum
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AU	1.272761	1.060300	1.2075085	7.291	88.419	0.0031	20.8927
GATS	0.096791	0.054800	0.3947385	29.091	938.837	0.0038	13.6667
TDTA	0.585252	0.622450	0.1997316	-0.613	-0.233	0.0139	0.9944
ROA	0.099471	0.079900	0.1066281	1.204	3.943	-0.2827	0.7778
Size	7.570993	7.442800	1.4865173	0.254	0.183	2.7473	12.1405
Growth	0.204161	0.145000	0.8040794	19.385	526.037	-0.9870	24.1430

Table 4 provides descriptive statistics of AU ratio of various sectors. AU ranges from maximum of 1.97 for miscellaneous sector to minimum of .53 for transport & communication sector. Higher value of asset utilization indicates efficiency of an industrial sector in utilization its assets. The other explanation of variance across different sectors in AU ratio is that as each sector has its own certain features and requires different asset base, maybe this differences between sectors resulted in varying AU across sectors. However, we can observe from Table 4 that fuel & energy and miscellaneous sector have asset utilization of greater than 1.5, paper & board, cement and transport & communication sectors have AU of less than one, while remaining sectors have AU ranging from 1 to 1.5.

Table 5 displays descriptive statistics of GATS ratio of different sectors. GATS ratio ranges from minimum of 4.77% from textile sector to maximum of 20.34% for sugar sector. Industrial sectors can be divided into to three groups on the basis of GATS ratio. First low GATS ratio group with ratio value of less than 10 and this group include textile, engineering, paper & board, cement and fuel & energy sector. The medium GATS ratio group for average ranging from 10% to 15% includes chemical and miscellaneous sector, while high GATS ratio group include sugar and transport & communication sector with GATS ratio above 15%.

Table 4: Sector wise descriptive statistics of AU ratio of sample firms

		AU				
		Mean	Median	Minimum	Maximum	SD
Sector	Textile	1.0373	0.9752	0.0109	4.1439	0.4770
	Chemical	1.2248	1.2035	0.0255	3.2368	0.6419
	Engineering	1.4460	1.3713	0.1256	3.5951	0.7219
	Sugar	1.1649	1.0334	0.0031	3.4014	0.6797
	Paper&Board	0.9045	0.7817	0.0540	2.7317	0.5309
	Cement	0.6914	0.5359	0.0076	2.7048	0.5067
	Fuel&Energy	1.8377	1.2197	0.0334	5.9971	1.6626
	Transport&Comm.	0.5334	0.5496	0.2014	0.9340	0.1719
	Misc.	1.9715	1.4522	0.0822	20.8927	2.4635

Table 5: Sector wise descriptive statistics of GATS ratio of sample firms

		GATS				
		Mean	Median	Minimum	Maximum	SD

Sector	Textile	Chemical	Engineering	Sugar	Paper&Board	Cement	Fuel&Energy	Transport&Comm.	Misc.
	0.0477	0.1468	0.0748	0.2034	0.0994	0.0944	0.0552	0.1759	0.1446
	0.0374	0.1379	0.0607	0.0479	0.0726	0.0476	0.0290	0.1314	0.1182
	0.0057	0.0091	0.0121	0.0153	0.0161	0.0129	0.0038	0.0585	0.0147
	0.8651	0.4231	0.2812	13.6667	1.2105	2.1367	0.3750	0.5526	0.7481
	0.0484	0.0810	0.0484	1.2703	0.1818	0.2214	0.0618	0.1344	0.1074

Table 6 provides mean and median values of leverage ratios across industry. Total leverage ratio is highest for textile sector with mean value of 66% followed by sugar and cement sector with both have TDTA ratio of 59%. Lowest TDTA ratio is of 40% for Paper and Board sector. Average TDTA ratio is more than 50% for all industries expect for paper & board and transport & communication sector.

Table 6: Sector wise comparison of leverage ratio of sample firms

Sector	TDTA	
	Mean	Median
Textile	.66	.68
Chemical	.51	.52
Engineering	.57	.58
Sugar	.59	.66
Paper&Board	.40	.39
Cement	.59	.60
Fuel&Energy	.55	.64
Transport&Comm.	.44	.46
Misc.	.51	.51

4.2 REGRESSION ANALYSIS:

We have used regression analysis on panel data of 265 firms for six years over the period of 2004-2009. As discussed above, the dependent variables used in regression are asset utilization ratio (AU) and general and administration expense ratio (GATS). We expect asset utilization (AU) ratio to be positively related to leverage ratio as increase in asset utilization ratio indicates reduce in agency cost. Expected relationship between GATS and leverage ratios is negative, as decrease in general and administration expense ratio indicates reducing agency conflict. To control the effect of profitability, size and growth of firm on dependent variables return on asset ratio (ROA), natural log of asset and growth in sales have been used.

4.3 PANEL DATA ANALYSIS:

For panel data regression analysis we started with initial sample of 1590 cross sectional observations collected for 265 firms over the period of 6 year. The initial data were trimmed by removing extreme low and high value for dependent variables, which resulted in different no of sample observations for

AU and GATS ratio. The total observations used for regression analysis when AU and GATS are used as dependent variables are 1548 and 1540 respectively. We have included 8 dummy variables to control effect of different industries. The partial correlation coefficients of AU and GATS with leverage ratio, while controlling the effect of control variables, are 0.193 and -0.204 respectively. The signs of coefficients show that increase in leverage will improve asset utilization and reduce general & administration expense ratio. Consistent with the agency cost hypothesis, this shows increase in leverage will reduce agency cost. Simple correlation coefficients between independent and control variables have been calculated to check the problem of multicollinearity. Table 7 and Table 8 present correlation coefficient between independent and control variables. The correlation coefficient of less than 0.6 between other variables shows absence of serious multicollinearity.

Table 7: Correlation matrix between Independent & control variables by using panel data of six years after removing extreme value of dependent variable AU

N = 1548	AU	TDTA	ROA	Size	Growth
AU	1				
TDTA	-0.032	1			
ROA	0.438	-0.371	1		
Size	-0.100	0.027	0.237	1	
Growth	0.024	-0.006	0.049	-0.030	1

Table 8: Correlation matrix between Independent & control variables by using panel data of six years after removing extreme value of dependent variable GATS

N =1540	GATS	TDTA	ROA	Size	Growth
GATS	1				
TDTA	-0.239	1			
ROA	0.086	-0.359	1		
Size	-0.136	0.055	0.230	1	
Growth	-0.051	-0.002	0.049	-0.026	1

Table 9 reports results for regression where asset utilization has been used as dependent variable. Regression models include eight dummies variables. In model 2 we have use square of total debt to asset ratio (TDTA²) to check non-linear relationship between debt and agency cost. The results of both linear and non-linear regression models have been reports in Table 9. Total debt ratio is positively related to asset utilization and significant at 1% level of significance. This is consistent with our early prediction of agency cost hypothesis. These results are similar to the results of Fleming et al (2005), Hua et al (2010) and Li and cui (2003), who also find positive relationship between asset utilization and leverage ratio. This shows increase in debt ratio will improve asset utilization, hence decreasing agency cost. ROA ratio has positive relation with AU, showing more profitable firms have higher asset utilization ratio. Relationship between AU ratio with size and growth is negative. The negative relationship between AU and size shows that small companies are more efficiently in utilization assets. The negative relationship between AU and growth shows that during sample period growth is sales was supported by increase in asset instead of increasing asset utilization.

Table 10 reports regression results when GATS ratio is used as dependent variable. TDTA ratio shows negative relation with GATS ratio. This relationship is significant at 1% level of significant in both tables. In model 2 we have estimated non-linear model by using squared term of TDTA ratio. The non-

linear model of TDTA also shows significant negative relation with GATS ratio. Consistent with our hypothesis, this negative relationship between GATS and leverage shows that increase in leverage reduces agency cost created by discretionary expenses. The relationship of GATS with ROA and size is negative. The negative relationship between GATS ratio and size give evidence of economies of scale. This shows bigger firms have less general and administration expense ratio as bigger companies can achieve economies of scale. The relationship between GATS ratio and growth is negative but insignificant. The coefficients of regression models show that increase in leverage has stronger effect on asset utilization than general & administration expense ratio. In our sample of Pakistan non-financial companies, textile sector accounts for approximately 40% of the total sample observation. To check consistency of our results, we select subsample of panel data by excluding textile sector from sample and run linear regression models again. The results not tabulated here shows similar results. TDTA ratio has significant positive relation with AU. The results of regression models when GATS is used as dependent variable are also consistent with earlier results. Total debt ratio (TDTA) ratio has significant negative relation with GATS ratio, which shows role of debt in reducing agency cost of discretionary expenses. These all results are consistent with our earlier regression results.

An important point to note is that in all models when total debt non-linear model is used, squared TDTA ($TDTA^2$) ratio has opposite effect on our both dependent variables, giving some evidence of non-linear relationship between agency cost and leverage ratio because of increasing agency cost of debt, bankruptcy costs and non-productive use of cash by managers. To further investigate the presence of nonlinear relation between TDTA and dependent variables, we have divided out panel sample observations in to five groups with TDTA range of 20%. This resulted in different number of sample observations for each group. Table 11 reports the results of regression model when AU has been used as dependent variable. TDTA has positive relationship with AU at 0-20%, 21-40% and 41-60% TDTA ratio ranges. This gives evidence that at these TDTA ratio ranges debt reduces agency cost by improving asset utilization of company. The relationship of asset utilization ratio with leverage ratio of up to 20% is insignificant. This shows up to 20% debt level, debt does not have significant effect on asset utilization. We can see from Table 11 that at leverage ratio ranges of 21-40% and 41-60% the relationship between asset utilization and debt is significant. This provides evidence that adding more debt above 20% will reduce agency cost by improving asset utilization ratio. But at TDTA ratio range of 61-80%, relationship between AU and TDTA has changed and regression result is showing negative but insignificant relationship between AU and TDTA. This gives indication that above 60% TDTA ratio has opposite effect on asset utilization. The relationship between TDTA and AU at TDTA range of 81-100% is also negative.

To check the consistency of threshold level identified by using asset utilization ratio as dependent variable, we have also used regression models with GATS as dependent variable. Table 12 presents regression results of model when GATS is used as dependent variables at various leverage ranges. The results are almost similar to the earlier results when asset utilization was used as dependent variable. Consistent with the earlier regression results, Table 12 results also show that at 0-20%, 21-40% and 41-60% ratio ranges TDTA has negative effect on GATS ratio and increases in TDTA decreases GATS ratio. But at TDTA percentage of above 60% this relationship has become positive, which shows at TDTA ratio of above 60% further increase in total debt is increasing GATS. The result of both tables is giving some indications of non-linear relationship between debt and agency cost that at TDTA ratio of above 60% and that further increase in total debt is increasing agency cost. To further investigate this we selected subsample from panel data with TDTA ratio of 60-65% and ran regression again. The results of regression using TDTA ratio range of 60-65% reported in Table 13 also show same opposite relation. The relation of AU and GATS with TDTA is negative and positive respectively, showing that increase in TDTA is increasing agency cost. The results of these regression models give some evidence that in Pakistani non-financial companies when debt ratio moves above 60% the debt controlling effect on agency cost starts to diminish due to increasing agency problem of debt; bankruptcy cost and non-productive use of cash by business managers.

Table 9: Relationship between dependent variable AU and other variables using panel data of six years

	model1		model2	
	b/se	p-value	b/se	p-value
TDTA	0.6793*** (0.101)	0.0000	1.9081*** (0.393)	0.0000
TDTA²			-1.1676***	0.0010
ROA	3.5074*** (0.260)	0.0000	3.4546*** (0.259)	0.0000
Size	-0.1017*** (0.015)	0.0000	-0.1026*** (0.015)	0.0000
Growth	-0.0105 (0.013)	0.4244	-0.0116 (0.013)	0.3633
Constant	1.4466*** (0.116)	0.0000	1.1958*** (0.141)	0.0000
Industry Dummies	Yes		Yes	
F-Value	44.6431***		42.0675***	
N	1548		1548	
R²	0.3232		0.3287	
R²Adj.	0.318		0.3231	

*Note: This table gives results of Panel data linear and non-linear regression analysis of 265 sample firms for period of six year, using Asset utilization ratio as an inverse proxy of agency cost. Independent variable is TDTA. In non-linear regression we have use squared term of Total leverage ratio (TDTA²). Control variables are ROA, size and growth. Original observation of 1590 sample firms were reduced to 1548 by removing extreme minimum and maximum values of Asset Utilization ratio from data before running regression. Definitions of all variables are given in Table 2. All regression models include 8 industry dummies, results of which are not reported here. Standard error values are given in parentheses. All standard errors are heteroscedasticity consistent standard errors. *, ** and *** indicate significance level of 10%, 5% and 1%*

Table 10: Relationship between dependent variable GATS and other variables using panel data of six years with using industry dummies

	model1		model2	
	b/se	p-value	b/se	p-value
TDTA	-0.0350*** (0.009)	0.0001	-0.1428*** (0.038)	0.0001
TDTA²			0.1025*** (0.033)	0.0019
ROA	-0.0761*** (0.018)	0.0000	-0.0713*** (0.018)	0.0001
Size	-0.0030*** (0.001)	0.0080	-0.0029** (0.001)	0.0102
Growth	-0.0043 (0.005)	0.3395	-0.0042 (0.005)	0.3591
Constant	0.1821*** (0.011)	0.0000	0.2037*** (0.014)	0.0000
Industry Dummies	Yes		Yes	
F-Value	54.3416***		51.4470***	
N	1540		1540	
R²	0.3767		0.3821	
R²Adj.	0.3718		0.3769	

*Note: This table gives results of Panel data linear and non-linear regression analysis of 265 sample firms for period of six year, using GATS as a proxy of agency cost. Independent variables are TDTA. In non-linear regression we have use squared term of Total leverage ratio (TDTA²). Control variables are ROA, size and growth. Original observation of 1590 sample firms were reduced to 1540 by removing extreme minimum and maximum values of GATS ratio from data before running regression. Definitions of all variables are given in Table 2. All regression models include 8 industry dummies, results of which are not reported here. Standard error values are given in parentheses. All standard errors are heteroscedasticity consistent standard errors. *, ** and *** indicate significance level of 10%, 5% and 1%*

Table 11: Relationship between dependent variable AU with other variables at various TDTA ratios ranges

	0-20%	21-40%	41-60%	61-80%	81-100%
	model1	model2	model3	model4	model5
	b/se	b/se	b/se	b/se	b/se
TDTA	3.9413 (2.418)	1.7469*** (0.671)	1.2847** (0.529)	-0.1898 (0.432)	-0.9962 (0.975)
ROA	3.2756*** (0.737)	3.1340*** (0.377)	4.3521*** (0.438)	4.3295*** (0.700)	0.2916 (0.777)
Size	-0.0887 (0.105)	-0.2013*** (0.024)	-0.1376*** (0.024)	-0.1005*** (0.028)	-0.0596* (0.034)
Growth	0.0918 (0.139)	-0.0807 (0.093)	-0.0126 (0.022)	0.0043 (0.067)	0.1246 (0.116)
Constant	0.6849 (0.629)	1.7355*** (0.280)	1.1273*** (0.337)	1.7135*** (0.302)	2.2987*** (0.854)

*Note: This table gives results of regression analysis by using asset utilization as inverse proxy of agency cost. Panel data were divided into five groups on the basis of TDTA ratio to see impact of different leverage ratio on agency cost and to indentify point at which controlling effect of leverage on agency cost starts to diminish due to increasing agency cost of debt and bankruptcy costs. Independent variables are total debt to asset ratio (TDTA). Control variables are ROA, size and growth. Definitions of all variables are given in Table 2. Standard error values are given in parentheses. All standard errors are heteroscedasticity consistent standard errors. *, ** and *** indicate significance level of 10%, 5% and 1%.*

Table 12: Relationship between dependent variable GATS with other variables at various TDTA ratios ranges

	0-20%	21-40%	41-60%	61-80%	81-100%
	model1	model2	model3	model4	model5
	b/se	b/se	b/se	b/se	b/se
TDTA	-0.5139* (0.260)	-0.0980 (0.084)	-0.1143* (0.062)	0.0481 (0.037)	0.1189 (0.106)
ROA	-0.0264 (0.068)	-0.0338 (0.040)	0.0336 (0.049)	0.0898** (0.042)	-0.0010 (0.092)
Size	-0.0066 (0.007)	-0.0039 (0.004)	-0.0085*** (0.003)	-0.0037* (0.002)	-0.0038 (0.003)
Growth	-0.0417* (0.023)	-0.0001 (0.009)	-0.0044 (0.027)	-0.0050 (0.004)	0.0052 (0.008)
Constant	0.2325*** (0.058)	0.1664*** (0.035)	0.2006*** (0.031)	0.0509* (0.030)	-0.0033 (0.098)

*Note: This table gives results of regression analysis by using GATS as a proxy of agency cost. Panel data were divided into five groups on the basis of TDTA ratio to see impact of different leverage ratio on agency cost and to indentify point at which controlling effect of leverage on agency cost starts to diminish due to increasing agency cost of debt and bankruptcy costs. Independent variables are total debt to asset ratio (TDTA). Control variables are ROA, size and growth. Definitions of all variables are given in Table 2. Standard error values are given in parentheses. All standard errors are heteroscedasticity consistent standard errors. *, ** and *** indicate significance level of 10%, 5% and 1%.*

agency cost of debt and bankruptcy costs. Independent variables are total debt to asset ratio (TDTA). Control variables are ROA, size and growth. Definitions of all variables are given in Table 2. Standard error values are given in parentheses. All standard errors are heteroscedasticity consistent standard errors. *, ** and *** indicate significance level of 10%, 5% and 1.

Table 13: Relationship between dependent variable AU and GATS with other variables at 60-65% TDTA ratio range

Independent Variables	model1	model2
	TDTA RATIO RANGE 60-65%	
	AU	GATS
	coefficient/SE	coefficient/SE
TDTA	-5.919* (3.42)	0.024 (0.25)
ROA	3.972*** (0.93)	0.081 (0.05)
Size	-0.062 (0.05)	-0.005 (0.00)
Growth	0.100 (0.18)	-0.006 (0.01)
Constant	5.025** (2.09)	0.075 (0.16)

*Note: This table gives results of regression analysis by using AU and GATS as dependent variable. Subsample of companies has been selected with TDTA ratio of 60-65%. Independent variables are total debt to asset ratio (TDTA). Control variables are ROA, size and growth. Definitions of all variables are given in Table 2. Standard error values are given in parentheses. All standard errors are heteroscedasticity consistent standard errors. *, ** and *** indicate significance level of 10%, 5% and 1%*

5. SUMMARY AND CONCLUSION:

In the current study, we have provided empirical evidence about the effect of financial leverage on agency cost by using six year sample data of 265 non-financial Pakistani companies over the period of 2004 to 2009. Asset utilization (AU) and general & admin expense ratio (GATS) have been as proxy measure of agency cost. The results of panel data regression show that total debt is positively related to asset utilization, confirming that debt reduces agency cost. The results of regression models when discretionary expense ratio is used as dependent variables show that total debt negatively affects discretionary ratio. This confirms the notion that leverage reduces agency cost created by discretionary expense of managers. As chances exist because of increasing agency cost of debt and non-productive use of cash generates by managers the original negative relationship between agency cost and leverage may become positive. To check this nonlinear relationship between agency cost and financial leverage, we have used nonlinear regression model. The results of non-linear models give some evidence of presence of nonlinearity between agency cost and total debt. To identify threshold point at which linear relationship becomes nonlinear we divided our sample data between five groups on the basis of TDTA ratio. The results of regression models provided some evidence that in Pakistan nonfinancial companies at TDTA ratio of above 60% the controlling effect on debt on agency cost starts to diminish and further increase in leverage increases total agency cost. The results also show that at leverage ratio of up to 20%, debt does not have significant effect on asset utilization and firms can improve their asset utilization by adding more debt above 20% level. The average debt level of non-financial sector of Pakistan is approximately 58%, which is almost equal to the threshold level of 60%. This show on average non-financial firms in Pakistan have debt ratio close to threshold level identify by this study. In lights of evidence found by this study, the firms having low debt level can reduce agency cost by adding more debt to their capital structure. Similar firms having excessive debt should try to reduce their debt level to balance the benefits and costs of debt. In nutshell, our empirical results appears to support our hypothesis that increase in leverage reduces agency cost and at higher level of financial leverage this relationship may become opposite because of increasing agency of debt, bankruptcy cost

and nonproductive use of cash by managers. There may be some limitations of the present study as well. Agency cost may also depend on other various factors including ownership concentration, managerial shareholding and size of board. We were unable to control these variables, having potential effect on agency cost, due to time limitation and lack of information available. No significant research has been conducted in Pakistan on the topic of agency cost and this area is relatively untouched in Pakistan. This study will identify the agency problem existing in companies of non-financial sector in Pakistan. The results of this study will help shareholders, managers and debt holder in deciding the role of debt in reducing agency cost. They will become aware of potential benefits and the consequences of the use of debt.

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