An Empirical Investigation of Agency Costs in the Determination of Performance of Pakistani Nonfinancial Sector*

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Abstract

The study examines the performance and its relationship with capital structure and agency cost with respect to the industrial configurations and economic groups of Pakistan Economy. The study employs data set of 334 listed joint stock companies from the non-financial sectors for the period of 1999-2009 from cotton and textile, engineering, chemical, sugar, cement, fuel and energy, paper and board, transport and communication, and miscellaneous economic groups. Pooled data from the Panel data methodology has been applied to observe the significance of different performance measures through determinant of capital structure and agency costs with special focus on the leverage and cash flows as the direct determinant and interactive variables. The empirical test results using redundant variable tests demonstrate support for agency theory in the context of Pakistan's industrial configurations. The implications of the study point towards more investigations on the subject using industrial configurations as control and moderating variables.

Keywords: Capital Structure, Industry-specific Effects, Agency Costs, Size, Performance, Nonfinancial sector.

JEL Classifications : C30, E30, L80.

1. Introduction

The persistent development of governance discourse has concerned the investment community to overcome the agency costs in professionally managed firms. Primarily based on conflict of interest between agents and principals, agency costs symbolize the lost value of a company resultant from the separation of ownership and control (Fernando, 2009). Since the business is influenced by the way it is financed, it has been emphasized that an optimal capital structure might reduce the agency costs and simultaneously improve the performance (Baker & Anderson, 2010). Consequently, the choice of an optimal capital structure to overcome the agency costs is frequently recognized as one of the imperative challenges faced by the corporate world.

The theory of capital structure was fashioned by the Modigliani and Miller (1958, 1963) corpus of scholarship in which mainly differences among levered and unlevered firms wasconsidered. Subsequently, it has been demonstrated that decisions regarding the choice of capital structure affect the agency costs and influence the companies'performance operating in both financial and non-financial industries (Berger & di Patti, 2006). It has also been highlighted that the choice of capital structures is dissimilar for financial and non-financial companies (Carlton, 1999; Ahmad et al., 2011). The main reason for this difference is the diverse financial conditions and nature of operations.

Ever since Modigliani and Miller seminal work, capital structure decisions in relation to agency costs has earned substantial scholarly attention from both the practitioners and academicians. Nevertheless, this stream of research has not gained the required consideration in the socio-economic context of Pakistan (Siddiqui & Shoaib, 2011). In particular, the needed research emphasis has yet not been given to measure the industrial performance of different economic groups of Pakistan using capital structure and agency costs proxies. Moreover, the effect of size on the agency costs explanation of capital structure and thereby on performance has not been researched extensively in the developing economies like Pakistan.

As the available empirical evidence confirms that an optimal capital structure to overcome the agency costs varies across and within the industries (Upneja & Dalbor, 2001), the current effort seeks to build a logical viewpoint to explain this variation across industrial configurations of Pakistan. Primarily, the objective is to lend support for the capital structure choice and agency costs effect on the performance of different industrial classifications. Secondly, the objective is to investigate whether or not size has an effect on the capital structure and agency costs'implications on performance. Finally, the aim is to justify the application of panel data models as an alternative methodology to measure the performance of the listed non-financial companies of Pakistan.

The organization of the article is structured as follows. Section 2comprises a review of relevant literature concerning the capital structure, agency costs and industrial performance. It presents the results

* The research is part of the Principal Author's PhD Dissertation in Finance

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of previous studies by identifying the inconsistencies within followed by a critical observation. Section 3presents the description of the data and the measurement techniques used for estimation along with the justification. Section 4 presents the findings and the results alongside an analysis. Section 5 is comprised of the conclusion, practical implications, and some of the limitations. Finally, section 6 includes the references and citations used in the study to strengthen the arguments advanced in the study.

2. Theoretical Background of the Study

Overcoming the agency costs to improve the performance has been researched time and again in the existing paradigm. There has become an increased realization that there ought to be a systematic way to overcome the agency costs in professionally managed companies. Agency costs arise as a result of the separation of ownership and control that is one of the major sources of agency conflict (Baker & Anderson, 2010). It has been confirmed that equity agency costs are increased with the separation of ownership and control. The results demonstrated by previous studies mostly advocate a positive relationship between equity agency costs and the separation of ownership and control (Fleminga et al., 2005). Raison d'être is that managers in a professionally managed company might not exert enough hard work, compared to the principals, to maximize the value of the company.

The achievement of an optimal capital structure to overcome the agency costs has been acknowledged as one of the decisive objectives to improve performance (Siddiqui & Shoaib, 2011). Capital structure has been defined as a system of loans, bonds, equity sales and options used by a company to finance itself (Anand, 2008 p.192). It has been demonstrated that capital structure decisions overcome the agency costs by making managers more efficient and accountable. According to agency costs hypothesis, a low debt to equity ratio increases the value of a company by overcoming the agency costs. It has been empirically advocated that an effective capital structure, in terms of debt to equity, restrain the managers to act in their self interest (Berger & di Patti, 2006).

Examining the impact of governance and ownership structure on the agency costs, McKnight & Weir (2009) found that increase in board ownershipand debt decrease the agency costs within the panel of large UK companies. The study also found that the major changes after the Cadbury period have usually not affected the agency costs. Moreover it has been advocated that, in general, neither asset specificity nor agency cost can be ignored as determinants of a firm's optimal capital structure. Therefore, both the factors must be considered for an optimal capital structure in an imperfect capital market setting. It has also been demonstrated the conditions for reducing transaction costs due to asset specificity are the same as those for reducing the agency costs of debt (Vilasuso & Minkler, 2001).

Principally, agency perspective offers an explanation to align the interests of principals and agents to improve performance by reducing the agency costs (Marnet, 2008). Decisions related to an optimal capital structure might play an effective role to overcome the agency costs by constraining managers to act in the best interest of shareholders. It has been found that high leverage reduces agency costs by constraining managers due to the threat of insolvency. The risk of liquidation also causes personal losses not only to managers' salaries but also to their reputation and perquisites (Williams, 1987). Debt also offers a mechanism to discipline the management by decreasing the unrestricted powers related with free cash flows (Harris & Raviv, 1990).

It has been argued that investment distortion because of top executives' overconfident conduct may be eliminated by overcoming the agency cost through improved supervision. High leverage as a determinant of capital structure also exerts pressure on the managers to create cash flows for the payment of interest expenses (Jensen, 1986). The findings clearly demonstrate that agency cost has a significant impact on the relationship among top executives' overconfidence and investment-cash flow sensitivity (Huang, Jiang, Liu, & Zhang, 2011). An optimal capital structure, therefore, might reduce the agency costs by overcoming the problems related to free cash flows.

Methodologically, most of the studies have relied on reverse causality, simultaneous equation models (See Berger & di Patti, 2006), multiple regression analysis (Parsons & Titman, 2008; Huang et al., 2011), Tobin's Q (See Morck et al.,1988), fixed and random effects model and Tobit regrssions (See McKnight & Weir, 2009), to measure the performance in relation to capital structure and agency costs. Although it has been justified that the use of panel data models to measure performance in relation to capital structure and agency costs explanation offers a better alternative for seemingly unrelated regression (SUR) and simultaneous equations models, however, this approach has not been given due attention in the context of Pakistan (Siddiqui & Shoaib, 2011). In particular, studies that specifically address the application of panel data models to nonfinancial companies'choice of capital structure and agency costs influences on performance remained somewhat absent.

The examination of the agency costs are in general based on regression analysis of the measures of companies'performance, indicators of leverage and several control variables. Most of the times a negative relationship has been reported, however, conflicting results are also documented. The measures of companies'performance are usually taken as ratios from the financial statements (Berger & di Patti, 2006). The results demonstrated by previous studies suggest that the relationship betweenprofitability and leverage is either positive or negative while capital structure has been found to be positively associated with size (Myres & Majluf, 1984).

Furthermore, it has been argued that the capital structure decisions are different for financial and nonfinancial companies. The main reason is that the requirement of almost all nonfinancial companies is to acquire capital for manufacturing and production facilities (Ahmad et al., 2011). It must also be highlighted that nonfinancial companies are an important part of different industrial classifications and economy as a whole. Thus, measuring the performance implications of nonfinancial companies with respect to capital structure and agency costs explanation has a significant standing for different economic groups and industrial configurations of Pakistan. In particular, the implications of agency costs and capital structure raise important issues regarding

the industrial performance.

3. Data and Measurement

In this section, variables and their measurement have been specified.

3.1. Sample Design

The sample consisted of 334 nonfinancial companies listed on Karachi Stock Exchange Pakistan over the period of 1999-2009. Data was obtained from the State Bank of Pakistan's balance sheet analysis of listed nonfinancial companies. The chosen nonfinancial companies represent nine different economic groups representing the industrial classification from cotton and textile, engineering, chemical, sugar, cement, fuel and energy, paper and board, transport and communication, and miscellaneous sectors. The criterion for the selection of the companies was based on the completeness and consistency of the data set over the years 1999-2009. Companies with inconsistent and omitted data sets have been excluded to avoid complications of statistical analysis. Moreover, being a listed nonfinancial company, over the years 1999-2009, was another requirement.

Pooled data was incorporated with a total of 334 cross-sections and 3674 panel observations. Furthermore, stratified random sampling has been used in the selection of nonfinancial companies from nine economic groups of Pakistan as identified by State Bank of Pakistan's analysis. Table 1 shows the configuration of the industry allocation of the sample incorporated in the study.

Table 1 explicates that the number of cross sections from different industries that have been used in the study to make up a total of 334 cross sections. It presents 146 cross sections from Cotton and Textile, 34 cross sections from Engineering, 29 cross sections from chemical, 32 cross sections from Sugar, 13 cross sections from Cement, 19 cross sections from Fuel and Energy, 7 cross sections from Paper and Board, 5 cross sections from Transport & communication and 49 cross sections from Miscellaneous group of industries. Moreover, the total number of pooled observations in Cotton & Other Textile Industry has been 515 from small firms, 732 from medium firms and 359 from large firms that make a total of 1606 observations. Similarly in Engineering industry the total number of pooled observations from small firms have been 105, from medium firms 135 and from large firms 134 that make up a total of 374 observations. In Chemical Industry the total number of pooled observations used in the study from small firms has been 116, from medium 88 and from large 115 that make a total of 319 observations. In Sugar Industry the total number of panel observations from small firms is 65, from medium firms 232 and from large firms 55 that make a total of 352 observations. In Cement Industry the total number of pooled observations from small firms is 1, from medium firms 43 and from large firms 99 that make a total of 143 observations. Moreover in Fuel and Energy Industry the total number of pooled observations used in the study from small firms has been 39, from medium firms 34 and from large firms 136 that make a total of 209 observations. From Paper and Board Industry the total number of pooled observations from small firms used in the study are 35, from medium firms 19 and from large firms 23 that make a total of 77 observations. Likewise from Transport & Communication Industry the total number of pooled observations from small firms used in the study is 7, from medium firms 8 and 40 from large firms that makeup a total of 55 observations. From Miscellaneous Industries the total number of pooled observations used in the study from small firms has been 264, from medium 164 and from large firms 111 that make up a total of 539 observations.

<Table 1> Sample Specification of Industries

Decomposition of Sample of Various Industries					
Industry	Cross Sections	Panel Observations			
		Small	Medium	Large	Total
Cotton & Other Textile	146	515	732	359	1606
Engineering	34	105	135	134	374
Chemical	29	116	88	115	319
Sugar	32	65	232	55	352
Cement	13	1	43	99	143
Fuel & Energy	19	39	34	136	209
Paper & Board	7	35	19	23	77
Transport & Communication	5	7	8	40	55
Miscellaneous	49	264	164	111	539
Total	334	1147	1455	1072	3674

Table 1 also shows that the panel observations forsmall firms were 515 from Cotton and Textile Industry, 105 from engineering industry, 116, 65, 1, 39, 35, 7 and 264 from Chemical, Sugar, Cement, Fuel & Energy, Paper & Board, Transport & Communication and Miscellaneous industries respectively. The total number of panel observations for small companies make up a total of 1147 observations. Likewise the total number of panel observations for medium firms make up a total of 1455 and that are comprised of 732, 135, 88, 232, 43, 34, 19, 8 and 164 for each industry in same order. Moreover the total number of panel observation for large firms make a total of 3674 including 359, 134, 115, 55, 99, 136, 23, 40 and 111 for each industry following the same order.

3.2. Variables and Measures

The variables explained in this section have been grouped into dependant and the independent variables. The dependant variable indicates performance of the industries whereas the independent variables are factors affecting performance of the industries.

3.2.1. Dependent Variables

Most of the previous researches have used return on assets and return on equity as measures of performance (e.g., Kim et. al, 2009; Chen, Lin, & Yi, 2008; Donaldson & Davis, 1991). However, the current study employs sales growth and net profit margin as another performance measure following Rechner & Dalton (1991). Table 2 shows the description and measurement of the dependent variables used in the study.

<Table 2> Measuring the Dependant Variables

Definitions of the Four Dependant Variables	
Description	Measurement
1.Return on Assets (ROA)	Net profit before tax as percent of total assets
2.Return on Equity (ROE)	Net profit before tax as percent of shareholder equity
3. Net Profit Margin	Net profit before tax as percent of gross sales
4. Sales Growth	$\frac{\text{Current year's sales} - \text{Last year's sales}}{\text{Last year's sales}}$

3.2.2. Explanatory Variables

Size is used as an independent variable to explain the responses in industrial performance. Book value of assets is proxy for firm size (Dalbor, Kim, & Upneja, 2004). Additional dummy variables have been generated using book value of assets to measure small, medium and large companies in each industrial configuration respectively. Instead of measuring increasing and decreasing effect of Size, this study plans to have clear effect of size in stages. For this purpose, dummy variables were generated based on size measured in different clusters of assets. Contrary to the dummy variables, if size is measured in terms of assets in currency units, it would not be possible to see the effect of firms falling in various ranges of size. Furthermore, assets in the format of time series produce the regression coefficients which do not meet the properties of the Best Linear Unbiased Estimators. Accordingly, a dummy variable is used to measure the small companies where '1'was coded in case total assets are less than 500 million rupees and '0' otherwise. For medium companies the dummy variable considered '1' in case total assets are greater than 500 and less than 2000 million rupees or else '0'. Similarly, for large companies the dummy variables take the value '1' in case total assets are greater than 2,000 million rupees and '0' otherwise.

The debt to equity ratio is used as a proxy forthe financial leverage (Ehikioya, 2007). Expense as a ratio of overhead and other expenses ratio to gross sales has been used as a measure of effectiveness of the firm management to control overhead and other costs, including excessive perquisite, and other direct agency costs (Ang et al.,2000). Cash flow ratio is used as a measure of efficiency of operations (Bliss, 2011). In addition, nine separate dummy variables have been generated each for Cotton and Other Textile, Engineering, Chemical, Sugar, Cement, Fuel and Energy, Paper and Board, and Transport and Communication industries in order to analyze the industry-specific effect on the dependant variable. The inclusion of dummy variables measures the variations of performance implications across the industries (Braun & Sharma, 2007. Table 3 presents the description and measurement of explanatory variables.

<Table 3> Explanatory Variables Explained

Description of the Explanatory Variables		
No	Description	Measurement
1	Small (Omitted Dummy)	"1" if the total assets are less tha 500 M Rs "0" Otherwise
2	Medium	"1" if the total assets are greater than 500 but less than 2000 M Rs "0" Otherwise
3	Large	"1" if the total assets are greater than 2000 M Rs "0" Otherwise
4	Expense	Cost of sales, administrative, selling, distribution, general and other expenses as percentage of gross sales
5	Financial Leverage	Total liabilities as percent of shareholder's equity
6	Cash Flow	$\frac{\text{Depreciation for the year} + \text{Retention in the business}}{\text{Depreciation for the year} + \text{change in the capital employed}} \times 100$
7	Cotton & Other Textile	"1" in case of Cotton & Other Textile sector, "0" otherwise
8	Engineering	"1" in case of Engineering sector, "0" otherwise
9	Chemical	"1" in case of Chemical sector, "0" otherwise
10	Sugar	"1" in case of Sugar sector, "0" otherwise
11	Cement	"1" in case of Cement sector, "0" otherwise
12	Fuel & Energy	"1" in case of Fuel & Energy sector, "0" otherwise
13	Paper & Board	"1" in case of Paper & Board sector, "0" otherwise
14	Transport & Communication	"1" in case of Transport & Communication sector , "0" otherwise
15	Benchmark (Omitted Dummy)	"1" in case of Miscellenous sector, "0" otherwise

4. Results and Analysis

The results discussed in this section of the study were categorized into two parts. Section 4.1 includes descriptive statistics such as analysis of variance and correlation coefficients of the variables. The subsequent sections are based on the results from estimated panel data models.

4.1. Descriptive Statistics

The analysis ROA in terms of descriptive statistics is presented in Tables 4 and 5. It depicts that the mean Return on Assets is 4.74 along with a standard deviation of 16.89. The ANOVA results indicate significant difference in the average value of ROA of the companies across various periods ranging from 1999 to 2009. Overall performance of the corporate sector of the economy has not been consistent across all the 11 years of the sample. The average return of all the sectors was the highest during the period of 2000 when the government had changed in the country and the economy of Pakistan escape the adverse effect of nine eleven. Since the USA and Pakistan relationships enable Pakistan to get its foreign debt liabilities rescheduled for the period of 8 to 15 years. That rescheduling of the foreign debts might have provided a relief to the industries. Afterwards the economy downturned and the average ROA declined from 8.4 in 2000 to 3.7 in the year of 2001. The performance ofthe sectors improved once again during the periods of 2004, 2005 and 2006. This was the period of revolutionary improvement in the financial sector of Pakistan. The performance not only improved to above 6 on the average but also remained consistent during period of three

years. The median values of the ROA reveal consistent performance of the industries for the period of 2001-2006.

<Table 4> Comparison of Average Values of ROA across the Period

Method	df	Value	Probability
Anova F-test	(10, 3651)	3.659541	0.0001
Welch F-test*	(10, 1458.63)	4.426721	0.0000

* Test allows for unequal cell variances

Analysis of Variance			
Source of Variation	df	Sum of Sq.	Mean Sq.
Between	10	10366.32	1036.632
Within	3651	1034213.	283.2683
Total	3661	1044579.	285.3261

Category Statistics				
DATEID	Median	Mean	Std. Dev.	Std. Err. of Mean
1/1/1999	2.550000	2.469207	12.97666	0.716516
1/1/2000	6.450000	8.418976	15.18989	0.833654
1/1/2001	3.600000	3.765559	12.88188	0.708052
1/1/2002	3.800000	3.722222	16.23854	0.889866
1/1/2003	3.350000	4.602994	13.86646	0.758739
1/1/2004	3.600000	6.342814	18.59994	1.017744
1/1/2005	3.700000	6.017365	12.39378	0.678158
1/1/2006	3.400000	6.035928	14.33931	0.784612
1/1/2007	1.400000	4.131437	19.15454	1.048090
1/1/2008	1.300000	3.677545	21.93789	1.200388
1/1/2009	1.250000	2.965868	23.19623	1.269241
All	3.100000	4.743692	16.89160	0.279133

<Table 5> Comparison of Variance of ROA across the Period

Method	df	Value	Probability
Bartlett	10	334.4878	0.0000
Levene	(10, 3651)	1.508808	0.1294
Brown-Forsythe	(10, 3651)	1.350351	0.1974

Category Statistics			
DATEID	Std. Dev.	Mean Abs. Mean Diff.	Mean Abs. Median Diff.
1/1/1999	12.97666	8.539705	8.539329
1/1/2000	15.18989	10.26392	10.15271
1/1/2001	12.88188	8.636942	8.635650
1/1/2002	16.23854	9.100834	9.100601
1/1/2003	13.86646	9.232185	9.131737
1/1/2004	18.59994	10.31988	10.00449
1/1/2005	12.39378	8.227592	7.980240
1/1/2006	14.33931	8.481753	8.060479
1/1/2007	19.15454	10.04253	9.625449
1/1/2008	21.93789	9.900102	9.485928
1/1/2009	23.19623	11.08825	10.86527
All	16.89160	9.441199	9.235882

Bartlett weighted standard deviation: 16.83058

In Table 5, variances of ROA of the companies of various industries have been compared across the periods of 1999-2009. ANOVA results reveal no significant difference of the level of uncertainty across the industries.

4.2. Correlation analysis

Table 6 shows the correlation of the variables used in the study. It is reasonably evident that the correlation between most of the variables is below the moderate level. Low level of correlation guarantees non existence of multicollinearity of the variables in the estimated models. However, a closer investigation of the correlations clearly illustrates that NPM and EXP are very highly correlated (-0.957). The negative relationship between EXP and NPM is very rightly justified on the argument that increase in expenses reduce the gap of revenue and cost. Similarly, the correlation among ROE and LEV is reasonably strong (-0.936). Assets of the company in general can be bifurcated into debt and equity. Withthe increasing proportion of debt, the equity holders have to suffer in terms of their returns which are calculated after the deduction of cost of debt. That is why the negative relationship between ROE and LEV is a significant number around 93 percent.

<Table 6> Correlation Results

Correlation Matrix							
Variables	Cash Flow	Leverage	Expense	Net Profit Margin	ROA	ROE	Sales Growth
Cash Flow	1						
Leverage	-0.001	1					
Expense	-0.120	0.000	1				
Net Profit Margin	0.124	-0.002	-0.957	1			
ROA	0.023	-0.026	-0.172	0.200	1		
ROE	0.001	-0.936	-0.010	0.010	0.049	1	
Sales Growth	-0.002	-0.000	-0.011	0.010	0.005	0.001	1

4.3. Regression Results

Table 7 shows the results of the first regression model in which NPM (Net Profit Margin) has been employed as the dependent variable. Cross-section weights were employed in order to control the Heteroskedasticity across the cross-sectional business entities. From amongst the industry-specific factors, the miscellaneous group of industry has been used as a bench mark for the comparison of other industries in their dummy variables format. The intercept is positive and highly significant indicating significant contribution in raising the overall industrial profit margin in the Pakistani nonfinancial sector.

<Table 7> Pooled Results of the Panel Data Models with NPM

Pooled Results with NPM as the Dependant Variable			
Dependent Variable: Net Profit Margin			
Variable	Coefficient	t-Statistic	Prob.
C	100.7776	208.6493	0.0000
CASH FLOW	0.0004	3.6477	0.0003
CEMENT	-3.7773 (97.00)*	-8.4764	0.0000
CHEMICAL	0.2968 (101.07)*	0.5754	0.5651
ENGINEERING	-2.1433 (98.63)*	-8.5834	0.0000
FUEL&ENERGY	-1.8658 (98.91)*	-3.5021	0.0005
PAPER&BOARD	-1.9233 (98.85)*	-2.9397	0.0033
SUGAR	-2.5148 (98.26)*	-4.5092	0.0000
TEXTILE	-4.7501 (96.03)*	-27.5460	0.0000
TRANS&COMM	0.8968 (101.67)*	1.9177	0.0552
LEVERAGE(DER)	-0.0003	-1.6689	0.0952
EXPENSE	-0.9817	-203.2084	0.0000
LARGE	-2.3505 (98.43)*	-13.5571	0.0000
MEDIUM	-1.1845 (99.59)*	-8.0214	0.0000
* The values in ( )are after adjustment with the intercept term			
R-squared	0.9306	Adjusted R-squared	0.9303
F-statistic	3597.8150	Prob (F-statistic)	0.0000

It is evident from the values of t-statistic that all the results are statistically significant except Chemical Industries. From the perspective of industry-specific factors, chemical industries did significantly contribute to the performance of overall Pakistani industries measured in terms of their net profit margin (NPM). All the other industries including Cement, Engineering, Sugar, Textile, Fuel & Energy, Paper & Board, Transport & Communication, have significantly contributed to the performance of the Pakistani industrial sectors. Despite being forefront state against the terrorism, the performance of Pakistani industrial sector has been quite encouraging. Hence, investment opportunities are not discouraging in Pakistan. That encouraging factor may be attributed to the fact the Pakistan Economy has been highly consumer oriented for the period of study that is, 1999-2009. However, the Chemical industry needs special attention and focus of the investors and the policy makers.

The positive sign of coefficient of Cash Flow Ratio clearly illustrates that the firms with increasing cash inflows have higher net profitmargins leading to their significant performance. Cash inflows also represent efficiency of the business entities in their operations. The better business operations may be considered as source of better performance in terms of their profit efficiency. The negative signs of the coefficients of Leverage (DER) reveal increasing outside agency costs of the businesses and cause net profit margin and firm's performance to decline. Likewise the negative sign of Expense also indicates adverse impact of rising expenses on the net profit margin (NPM) and financial performance of the firm. Profit is the difference between cost expenditures and sales revenues of the businesses. With rising cost, the profit margin is likely to fall.

The performance of TRANSPORT & COMMUNICATION Industry has been observed much better than the other industries included in the paper, in terms of their profit margins. The other industries are underperforming in business in terms of their profit margins. It may be inferred that there is a difference of industrial configuration in terms of performance implications of the net profit margins (NPM). The model presented in the Table 6 also explicates that the performance of small firms in the industry is better in terms of profit margins compared to medium and large firms. Large and the medium firms from different industries have compared with the third category used as a benchmark. The intercept term is the bench mark category. Hence the coefficients of the other two categories have been calculated based on the value of the base category represented by the intercept. It may be inferred that managing the net profit margins in small firms is relatively convenient as compared to the large and the medium firms. The F-statistic for the model (3597.815) proves overall significance of the model. The adjusted R-squared with the value of (0.9303) indicates overall very good fit and a high explanatory power after the adjustment of the degree of freedom, and weights for the correction of Heteroskedasticity.

<Table 8> Redundant Variables Test(Redundant Variables: DER CFR)

F-statistic	Value	df	Probability
	7.417174	(2, 3660)	0.0006
F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	64714.24	2	32357.12
Restricted SSR	16031316	3662	4377.749
Unrestricted SSR	15966601	3660	4362.459
Unrestricted SSR	15966601	3660	4362.459

The redundant variable test was applied on the agency variables of leverage (DER) and cash flows (CFR) in order to test the significance of these two variables. The null hypothesis of DER and CFR being the redundant variable is rejected based on the probability of Type I error. Results are presented in the Table 8. The results clearly reveal significance of the variables related to the internal and external agency costs of the industries. Agency costs and the capital structure are very closely related concepts wherein performance of the industries are significantly affected by the agency costs related variables. On the application of the redundant variable test the significance of the capital structure related variables remains least affected. That also proves the significance of the capital structure related variables for the determination of the performance of the industries.

<Table 9> Pooled Results of the Panel Data Models with ROE

Results with ROE as the Dependant Variable			
Dependent Variable: Return On Equity			
Variable	Coefficient	t-Statistic	Prob.
C	29.31124	31.38468	0.000
CASH FLOW	0.000381	0.908074	0.3639
CEMENT	-21.62089 (7.69035)*	-11.55869	0.000
CHEMICAL	-6.454056 (22.857184)*	-5.67339	0.000
ENGINERING	6.077781 (35.389021)*	4.41737	0.000
FUEL&ENERGY	0.394053 (29.705293)*	0.161778	0.8715
PAPER&BOARD	-5.017614 (24.293626)*	-2.661965	0.0078
SUGAR	-6.896459 (22.414781)*	-3.808483	0.0001
TEXTILE	-5.552483 (23.758757)*	-6.136662	0.000
TRANSPORT&COMM	-3.605 (25.70624)*	-0.773786	0.4391
LEVERAGE	-0.119539	-233.8551	0.000
EXPENSE	-0.024833	-8.329784	0.000
LARGE	15.49357 (44.80481)*	17.8004	0.000
MEDIUM	10.25715 (39.56839)*	12.22543	0.000
* The values in ( )are after adjustment with the intercept term.			
R-squared	0.940704	Adjusted R-squared	0.940484
F-statistic	4261.499	Prob (F-statistic)	0.000

The results presented in Table 9 are based on ROE as the dependant variable regressed through panel data model on the same variables such as leverage, cash flow ratio, size of the companies as dummy variables and industrial dummies. Although results almost remain the same in principle yet some very important implications are found from these results.

The relationship of CFR (cash flow ratio), and the dummy variables of Fuel & Energy, Transport & Communication, is not significant any more with the dependant variable ROE. However, the sign remain unchanged. Furthermore, the negative signs of the coefficients of Leverage (DER) and Expense illustrate that capital structures containing higher debt have had a negative effect on the return on equity used as a measure of performance of the industries. So, the capital structure is relevant in explaining the performance of the industries. The F-statistic for the model (4261.499) is significant for the model. Moreover, the adjusted R-square value of (0.940484) indicates that the model has an overall very good fit and the model has high explanatory power.

<Table 10> Redundant Variables Test (Redundant Variables: CFR DER)

	Value	df	Probability
F-statistic	17525.86	(2, 3660)	
F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	1.85E+09	2	9.27E+08
Restricted SSR	2.05E+09	3662	559348.2
Unrestricted SSR	1.94E+08	3660	52912.47
Unrestricted SSR	1.94E+08	3660	52912.47

In the agency cost hypothesis cash flow (CFR) and the Leverage (DER) are the key variables. Feeling the need of significance of these variables, we decided to apply the redundant variable test in order to test their relevance for the performance of the industries in Pakistan. The results are presented in the Table 10. The null hypothesis of the test in respect of CFR and DER that they are redundant is significantly rejected. Resultantly, the DER and CFR both are significantly important for the model representing the performance of Pakistani Industries in the nonfinancial sector.

<Table 11> Pooled Results of the Panel Data Models with ROA

Results with ROA as the Dependant Variable			
Variable	Coefficient	t-Statistic	Prob.
C	7.4624	19.2863	0.0000
CASH FLOW	0.0005	3.4280	0.0006
CEMENT	-7.1837 (0.2787)*	-8.5538	0.0000
CHEMICAL	3.3645 (10.8269)*	5.5228	0.0000
ENGINERING	-0.0608 (7.4016)*	-0.1136	0.9096
FUEL&ENERGY	-3.4205 (4.0419)*	-5.7330	0.0000
PAPER&BOARD	5.3485 (12.8109)*	4.6327	0.0000
SUGAR	-5.1953 (2.2671)*	-8.9729	0.0000
TEXTILE	-5.1571 (2.3053)*	-13.4119	0.0000
TRANS&COMM	1.0650 (8.5274)*	0.6340	0.5261
LEVERAGE	-0.0002	-3.5403	0.0004
EXPENSE	-0.0112	-11.2991	0.0000
LARGE	2.6615 (10.1239)*	7.9109	0.0000
MEDIUM	0.7119 (8.1743)*	2.2675	0.0234
* The values in ( )are after adjustment with the intercept term.			
R-squared	0.1968	Adjusted R-squared	0.1938
F-statistic	65.7545	Prob(F-statistic)	0.0000

Considering ROA as the dependant variable the pooled data results are presented in the Table 11 for perusal. The miscellaneous industries have once again outperformed. Chemical and paper board industries are the only industries which performed better than the miscellaneous industries when performance is measured in terms of return on assets. However, engineering industries do not seem to have statistically performed significantly. The other industries such as cement, chemical, fuel and energy, paper board, sugar industries, textile sector seemed to have performed significantly while measured in terms of returns on assets. Large and the medium sized industries performed much better than the small industries when compared with the bench marked small industries.

<Table 12> Redundant Variables Test(Redundant Variables: CFR DER)

	Value	df	Probability
F-statistic	12.49544	(2, 3660)	
F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	6377.171	2	3188.585
Restricted SSR	940335.3	3662	256.7819
Unrestricted SSR	933958.2	3660	255.1798
Unrestricted SSR	933958.2	3660	255.1798

The redundant variable test was again applied to check once again the significance of the agency costs related variables in the determination of the capital structure and the performance of the industries in Pakistan Economy. The results are presented in the Table 12 for perusal. The level of significance once again reiterates the significance of the agency cost theory in relevance with the capital structure performance of the Pakistani industries.

All the results from empirical tests prove significant relationship of agency cost theory, capital structure and the performance of the industries in Pakistan irrespective of the measure of performance in terms of net profit margin, return on equity and return on asset.

Furthermore, the positive and significant coefficient of Cash Flow Ratio (CFR) indicates that firms with increasing cash flows enjoy better return on assets. Additionally large firms perform the best in the categories of small, medium and large firms of the Economy of Pakistan, when measured in terms of ROA. The significant results may be attributed to the large economies of scale and economies of scope. However the negative coefficients of Fuel & Energy, Cement, Sugar and Textile industry make it certain that these industries performed relatively less than the other industries included in the model while considering ROA as the measure of return on assets. In addition the negative sings of coefficients of the Leverage (DER) and Expenses is consistent with the first two models indicating that highly leveraged firms had lesser prediction for higher ROA (return on assets). The F-statistic for the model (65.7545) is significantly large providing the evidence of overall significance of the model. However, the adjusted R-squared value of the model (0.1938) is a relatively lower number revealing that there are many more determinants of return of assets other than the factors considered for this study.

Another test of the performance of the industries was done by employing sales growth as the dependant variable. The results are presented in the Table 13 for perusal. The results are significant except for the variables of Cash Flow, Engineering, Fuel & Energy, Leverage and Medium sized industries. The F-statistic for the model (6.0059) is significant revealing the overall significance of the model. However, the adjusted R-square value of the model (0.0185) is much less than those measured in the previous models. Insignificance of the leverage in the determination of sales growth sounds logical. Sales growth is a marketing perspective and perhaps it is least related to the leverage of the industries. The model with sales growth does not seem of much relevance to us in relating the capital structure, performance and the agency costs hypothesis.

<Table 13> Pooled Results of the Panel Data Models with Sales Growth

Results with Sales Growth as the Dependant Variable			
Variable	Coefficient	t-Statistic	Prob.
C	21.8339	8.0252	0.0000
CASH FLOW	0.0001	0.4643	0.6425
CEMENT	-9.6567 (12.1772)*	-3.0365	0.0024
CHEMICAL	-7.7386 (14.0953)*	-2.9395	0.0033
ENGINEERING	3.3361 (25.17)*	0.9985	0.3181
FUEL&ENERGY	-3.7788 (18.0551)*	-1.2046	0.2285
PAPER&BOARD	-6.9359 (14.898)*	-2.1603	0.0308
SUGAR	-6.5497 (15.2842)*	-2.1786	0.0294
TEXTILE	-8.0371 (13.7968)*	-3.1945	0.0014
TRANS&COMM	-14.8838 (6.9501)*	-4.2826	0.0000
LEVERAGE	0.0001	1.1004	0.2712
EXPENSE	-0.0385	-4.8262	0.0000
LARGE	2.3759 (24.2098)*	1.7155	0.0864
MEDIUM	0.3462 (22.1801)*	0.2594	0.7953
* The values in ( )are after adjustment with the intercept term.			
R-squared	0.0221	Adjusted R-squared	0.0185
F-statistic	6.0059	Prob(F-statistic)	0.0000

Table 14 reveals the interactive effect of leverage with various industries in order to understand effectiveness of agency costs hypothesis. Nonlinearity was also tested in the model and results are presented in the Table 14. The results on perusal reveal non significance of the nonlinearity of the leverage. The coefficient of Leverage2 is extremely low to the extent of ignorable value with probability of 76.62%. In order to single out effect of agency cost on each of the industries their dummy variables were multiplied by the leverage variable in addition to the industrial dummies included in the regression equations. The results seem tohave improved significantly

<Table 14> Pooled Results of the Interactive Effects of Agency Cost Hypothesis

Dependent Variable: Return On Assets			
Variable	Without Leverage Effect	With Leverage Effect	Prob.
C	7.193017	—	0.0000
CASH FLOW	0.000512	—	0.0003
CEMENT*DER	0.003623	6.393885	0.0022
CHEMICAL* DER	0.005728	16.823031	0.0000
ENGINERING* DER	0.002076	13.946494	0.0408
FUEL&ENERGY* DER	-0.001301	11.647985	0.3646
PAPER&BOARD* DER	-0.052164	24.68145	0.0000
SUGAR* DER	0.001095	9.333708	0.0184
TEXTILE* DER	0.001254	9.206794	0.0010
TRANS&COMM* DER	0.005878	13.622236	0.0000
LEVERAGE2	3.01E-10	—	0.7662
EXPENSE	-0.011511	—	0.0000
LARGE* DER	-0.004620	18.822321	0.0000
MEDIUM* DER	0.000210	15.197629	0.3189
R-squared	0.228421	Adjusted R-squared	0.223346
F-statistic	45.01102	Prob(F-statistic)	0.0000

indicating that the Return on Assets is likely to increase for each of the industries when leverage is provided. The values of all the coefficients have increased with better t-statistics than the model without leverage interaction. The coefficients of large and medium industries have also increased significantly with the interactive effect of leverage as compared to their benchmarked small scale industries.

The interactive effects of leverage were also calculated considering NPM, ROE and Sales Growth as the dependant variables. The results have not been reported in the paper with a view to space saving. Coefficients of all the industries improve with the interactive effect of leverage in all the four cases of the dependant variables.

From the discussions, interactive effects of leverage and redundant variable tests it can be concluded that agency costs hypothesis is very pertinent to evaluate performance of the Pakistani businesses and industries. Leverage has linear rather than non relation with the performance of the industries measured in terms of capital structure of the businesses.

5. Summary and Conclusions

The current study has empirically tested the relationship of three very important areas of corporate finance such asagency costs, capital structure and the performance of nonfinancial companies representing different corporate sectors of Pakistan. Using the pooled data set and employing the cross-section weights four perspectives of the performance of the industries have been empirically explored. Findings of the four different specifications support significance of leverage, in linear form, as an indicator of agency costs hypothesis. The performance of industries is adversely affected by the element of increasing agency costs in case of Pakistani corporate sector. According to the results of the study, high cash flows ratio positively affects the performance of industries. Nevertheless, results obtained for different performance measuresare not identical. Findings of the study are significantly different from Berger & di Patti (2006) and McKnight & Weir (2009).

It has been safely concluded that the findings are consistent with the theory of agency costs to greater extent. The findings depict low leverage of the companies providing an incentive to managers in reducing total agency costs by overcoming the agency costs of outside equity. Nonetheless, "when threat of insolvency becomes more evident, the agency costs of outside debt overwhelm the agency costs of outside equity. That is why further increase in leverage may result in higher agency costs" (Berger & di Patti, 2006 p.1066; Jensen & Meckling, 1986).

Based on results, this study recommends further studies in the area of capital structure and agency costs by employing ownership structure of the corporate sector of Pakistan. Consideration of the ownership structure, tax structure and macroeconomic policy variables in the models shall help further strengthening of the theories of capital structure and agency costs. There is also need to empirically explore capital structure and agency cost for every individual industry if order to infer behaviorof the population of corporate sector of Pakistan. The current study opens an avenue for further studies.

Received: March 30, 2012.
Revised: May 11, 2012.
Accepted: May 18, 2012

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