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Research

# IMPACT OF CAPITAL STRUCTURE ON PERFORMANCE OF NON-FINANCIAL LISTED COMPANIES IN PAKISTAN

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## Abstract

*This study examines the relationship between capital structure and financial performance using a broad sample of 213 non-financial firms listed on the Karachi Stock Exchange (KSE) over the period 1999-2015. The relationship between financial performance and capital structure is estimated using fixed and random effect models. Sector-wise comparison shows that for the majority of sectors, higher short- and long-term debt has a significant negative impact on financial performance; however, magnitude of this effect varies across industries. The results suggest that in order to improve performance, companies' management should decrease their reliance on debt finance.*

**Keywords:** Capital structure, financial performance, industries, Pakistan

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## Introduction

Capital structure is defined as the combination of debt and equity finance. An optimum capital structure can maximize the firms' value. In a competitive and ever changing business environment, stakeholders have keen interest in the growth of the companies. Management and shareholders use different ratios to quantify the financial performance of a company. These ratios can be derived the from balance sheet and income statement of a company and are classified as financial ratios (Degryse et al. 2012).

Theoretical foundation on the relationship between capital structure and firm performance was first laid by Modigliani and Miller in 1950's. They first proposed that the firm's value is independent of its capital structure. Later on, Modigliani and Miller's capital structure theory was revised in 1963 and it was argued that due to tax advantage of debt financing, firm value can be increased by changing the capital structure. In addition, several other theories like agency theory (Drobetz et al. 2013), signaling theory (Lindblom et al., 2011; Muzir, 2011), Pecking order theory (Myers, 1984), trade-off theory, franchise-value hypothesis and the efficiency-risk hypothesis (Berger and Di Patti, 2006) discuss the relationship between capital structure and firms' performance. More recently, Stephan et al., (2011) and Bandyopadhyay and Barua (2016) provide importance evidence on the relevance of agency cost, signaling and liquidity risk, financial constraints, and tax incentive for the capital structure decisions in emerging financial markets. In a similar vein, Bharath et al., (2009) and Gao and Zhu (2015) suggest that capital structure decisions are largely driven by information asymmetry.

In developing countries, Khan (2012) and Onaolapo and Kajola (2010) find that long-term debt (short-term debt) negatively (positively) affects the firms' performance. Notably, most of the previous studies (See e.g., Fosberg and Ghosh, 2011; Ebaid, 2009 and

Crnigoj and Mramor, 2009, among others) utilize return on assets (ROA) as the performance measure and found a negative relationship between performance and higher levels of debt. Chaudhuri el al., (2016) used MIMIC model to estimate latent firm performance (ROA & Tobin's Q) for Indian corporate firms and found that level of debt financing do not impact the firm performance. However, Fosu et al., (2016) using large sample of UK firms suggest that leverage has a negative impact on firms' value. Furthermore, Salim and Yadav (2012) and Islam and Khandaker (2015) argue that business and operational nature of firms differ across industries and hence capital structure decisions and its impact on financial performance depend on the industrial classification of the companies. In Pakistan, Khan (2012), Saeed and Badar (2013) and Bashir et al., (2013) found a negative relationship between higher debt and firm performance for food and sugar sectors.

Pakistan is an emerging economy where most of the companies depend on bank loans to fund their venture requirements (Shahzad et al., 2015). Many financial institutions have been denationalized and therefore the companies with more volatile income can gain access to funds on high interest rates. The State Bank of Pakistan (SBP) is putting efforts to develop the Marketable Government securities with special attention on increasing the investor base to improve the liquidity in debt and capital markets.[3] Initiatives have been taken by the Government of Pakistan to remove the anomalies in interest rate structures to develop the corporate bond market.[4]

Based on the above discussion, it is important to examine how much and for which industries, capital structure decisions impact the financial performance of companies listed in Karachi Stock Exchange. Following previous studies on financial strategies relaying on the pecking-order theory and the trade-off theory, our analysis use a dynamic panel data consisting of 213 Pakistani non-financial

[1] Pakistan Economic Survey

[2] State Bank of Pakistan's Annual Performance Review Report

companies for the period 1999-2015. We contribute to the existing literature on the capital structure's theoretical puzzle by examining industry-level data.

Rest of the study is planned as follows. Section 2 describes the theoretical framework. Data and empirical findings are presented in section 3. Section 4 concludes the study with some policy recommendations.

## Theoretical / Conceptual Framework

It is difficult to proxy the firm's performance by a single variable. Previous studies have mainly used net profit margin, returns on assets (ROA) and return on equity (ROE) as the measures of corporate financial performance. For a comprehensive analysis, we gauge the financial performance of companies using ROA, ROE, Tobin's Q ratio (TQ) and price to earnings ratio (PE). ROA and ROE are the accounting ratio based measures of financial performance (Nazir and Afza, 2009). Tobin's Q ratio presents the growth potential and market value of a firm and hence is considered a better performance measure. The capital structure is measured in term of both short-term and long-term debt. Table 1 shows the details i.e., definition, formula and references of variables under consideration.

Our main objective is to examine the relationship between capital structure and company's performance at industry level while controlling for firm size, sales growth, assets turnover and operating risk. However, the changes in capital structure may have a positive or negative impact on the financial performance of a particular industry; it's a priory which is unclear. The methods of financing as well as the access to financial resources impact the cost of capital therefore higher debt level may pose a higher bankruptcy risk. Hence, higher leverage may have a negative impact on financial performance during distressed times (Campello, 2003). While the increase in debt is also expected to lower the inefficiency, reduce the information costs,

*Table 1:*
**Details of the variables**

| Variable | Definition | Formulation | Reference(s) |
|---|---|---|---|
| **Panel A:** Dependent Variables | | | |
| Return on Assets (ROA) | The profitability of a company in relation to its total assets. | Net profit before taxes divided by average non-current assets and current Assets | |
| Return on Equity (ROE) | The efficiency of firms to generate profits with every unit of shareholder's equity | Net profit before taxes divided by average shareholder's equity | |
| Tobin's Q (TQ) | It measures the market value of debt & equity to book value of Assets. | Book value of total debt plus market value of equity divided by book value of total assets | Salim and Yadav (2012) |
| Price to Earnings Ratio (PE) | It evaluates a company's current share price in comparison with its per-share earnings | Price per share divided by earnings per share (EPS) | |
| **Panel B:** Independent Variables | | | |
| Debt to equity ratio (DTE) | The proportion of debt and equity used to finance the assets | Total liabilities divided by shareholder's equity | |
| Short-term Debt Ratio (STDA) | Short-term funding sources of the companies | Short term debt divided by total assets | Bandyopadhyay and Barua (2016) |
| Long–term debt Ratio (LTDA) | It measures the financial risks faced by the companies | Long term debt divided by total assets | |
| **Panel C:** Control Variables | | | |
| Size (SIZE) | Size of a company is recognized by its total sales | Net sales of individual company divided by total net sales for all companies | Salim and Yadav (2012) |
| Sales Growth (SG) | The growth potential of a company | Current year sales minus last year sales divided by last year sales | |
| Operating Risk (OR) | Operating risk addresses a firm's ability to utilize its assets during the periods of bad performance | Total assets divided by sales | Bandyopadhyay and Barua (2016) |
| Asset Turnover Ratio (ATR) | It indicates the efficient use of assets to generate revenue | Sales divided by average of all assets | |

reinforce corporate discipline and thereby may results in better firm's performance (Fosu, 2013).

To test the above hypothesis, we utilize panel data framework i.e. Fixed effect and Random effect models (see e.g., Baltagi, 2005) to examine the impact of capital structure decisions on financial performance. Fixed effect estimates are consistent if the cross-sections are correlated with the explanatory variables while random effects are consistent when the firm specific effects of explanatory variables are independently and randomly distributed. To examine the relationship between financial performance and a set of explanatory variables, following regression models are used:

$$ROA_{it} = \beta_{10} + \beta_{11}STDA_{it} + \beta_{12}LTDA_{it} + \beta_{13}DTER_{it} + \beta_{14}SIZE_{it} + \beta_{15}SG_{it} + \beta_{16}OR_{it} + \beta_{17}ATR_{it} + u_{it} \quad (1)$$

$$ROE_{it} = \beta_{20} + \beta_{21}STDA_{it} + \beta_{22}LTDA_{it} + \beta_{23}DTER_{it} + \beta_{24}SIZE_{it} + \beta_{25}SG_{it} + \beta_{26}OR_{it} + \beta_{27}ATR_{it} + u_{it} \quad (2)$$

$$TQ_{it} = \beta_{30} + \beta_{31}STDA_{it} + \beta_{32}LTDA_{it} + \beta_{33}DTER_{it} + \beta_{34}SIZE_{it} + \beta_{35}SG_{it} + \beta_{36}OR_{it} + \beta_{37}ATR_{it} + u_{it} \quad (3)$$

$$PE_{it} = \beta_{40} + \beta_{41}STDA_{it} + \beta_{42}LTDA_{it} + \beta_{43}DTER_{it} + \beta_{44}SIZE_{it} + \beta_{45}SG_{it} + \beta_{46}OR_{it} + \beta_{47}ATR_{it} + u_{it} \quad (4)$$

where, $u_{it} = \mu_i + \upsilon_{it}$ . $\mu_i$ denotes the unobserved firm specific effect and $\upsilon_{it}$ denotes the random error which varies across firms and time. The subscript '*i*' denotes firms and the subscript '*t*' denotes time. First the relationship between capital structure and performance is examined all companies in the sample. Then the individual industry's capital structure variables are regressed with firm performance indicators. Hausman (1978) test is used to examine the best fitted model among fixed effect and random effect specification.

## Data and empirical findings

We use secondary data from 1999 to 2015 of all non-financial firms listed on KSE. The financial firms are excluded from the sample because their financial structure and reporting standards are different from non-financial firms. Non-financial corporate sector of Pakistan is an important segment which is contributing a lot in the economy of a country and also considered as a complete, established and vigorous industrial base. We select a sector which has more than ten listed companies over the sample period. Data is collected from the balance sheet analysis published by the State Bank of Pakistan and from business recorder. Table 2 reports the industries, number of firms in each industry and share of a particular sector in our sample.

*Table 2:*

**Total firms from each sector**

| Industry Sector | Number of Firms | Share of each sector (%) |
|---|---|---|
| Textile | 113 | 0.5305 |
| Food | 42 | 0.1972 |
| Chemical | 25 | 0.1174 |
| Fuel & Energy | 18 | 0.0845 |
| Cement | 15 | 0.0704 |
| Total | 213 | 1.0000 |

Source: Karachi Stock Exchange, State Bank of Pakistan and Business Recorder

Table 3 reports the descriptive statistics of the variables. The large mean value of ROE i.e. 8.754 indicates that firms are highly leveraged because higher ROE (greater than one) show an overly financed firm. Returns on assets have the lowest standard deviation. The statistics show that listed companies use more short-term debt compared to long-term debt. TQ ranges between 3.433 and 4.724. Tobin's Q higher than one implies that there is high growth potential, higher market value and better operating performance.

*Table 3:*

**Descriptive statistics**

| Variables | N | Mean | Median | Standard dev. | Minimum | Maximum |
|---|---|---|---|---|---|---|
| ROA | 3621 | 5.321 | 4.420 | 6.983 | 1.302 | 9.621 |
| ROE | 3621 | 8.754 | 4.600 | 5.402 | 6.725 | 12.02 |
| TQ | 3621 | 3.974 | 2.280 | 3.121 | 3.443 | 4.724 |
| PE | 3621 | 7.648 | 4.450 | 4.285 | 4.602 | 8.926 |
| STDA | 3621 | 0.589 | 1.700 | 1.454 | 1.775 | 4.120 |
| LTDA | 3621 | 0.437 | 1.580 | 1.297 | 1.617 | 1.923 |
| DTER | 3621 | 1.359 | 2.990 | 1.039 | 1.358 | 2.724 |
| OR | 3621 | 2.019 | 2.230 | 2.776 | 2.006 | 2.428 |
| ATR | 3621 | 1.437 | 2.400 | 1.845 | 0.164 | 1.524 |
| SG | 3621 | 5.230 | 8.100 | 4.104 | 1.425 | 6.726 |
| SIZE | 3621 | 3.205 | 2.080 | 1.052 | 1.372 | 7.725 |

**Note:** This table reports the descriptive statistics of panel of 213 companies listed on KSE over the period 1999 till 2015.

Table 4 shows the correlation between independent and control variables. The correlation coefficients depict that multi co-linearity is not a issue as none of the variable has pair wise correlation of more than 0.5.

*Table 4:*

**Pearson correlation matrix of independent and control variables**

| Variables | STDA | LTDA | DTER | ATR | OR | SIZE | SG |
|---|---|---|---|---|---|---|---|
| STDA | 1 | | | | | | |
| LTDA | -0.250* | 1 | | | | | |
| DTER | -0.057* | -0.005 | 1 | | | | |
| ATR | -0.059* | -0.024* | 0.007 | 1 | | | |
| OR | 0.057 | 0.046 | 0.005 | -0.235 | 1 | | |
| SIZE | -0.087* | -0.029 | 0.021 | 0.297* | -0.046* | 1 | |
| SG | -0.029 | 0.022* | 0.003 | 0.028 | -0.003* | 0.006* | 1 |

**Note**: * indicates significance at 5 percent level.

The results of full sample regression analysis (see table 5) show that STDA, LTDA, and sales growth (ATR) have a significant (at conventional level of significance) negative (positive) impact on ROA. Companies having higher leverage have less return on assets. Overall the independent variables are explaining 76.1% variation in ROA. All the capital structure proxies i.e., STDA, LTDA and DTER have a significant negative impact on ROE. R-square value suggests that independent variables collectively explain 46.9% variations in ROE. Tobin's Q is significantly positively (negatively) impacted by LTDA (DTER). However, the STDA do not impact the TQ. Similarly LTDA has a significant negative impact on the PE. The selected independent variables explain. 29.6% and 19.4% variations in TQ and PE ratio, respectively. OR also has a significant negative impact on PE implying that companies with more operating risk have lower PE ratio. The values of Durbin-Watson are within the acceptable range (around 2) indicating that there is no problem of auto-correlation in the data while the problem of heteroskedasticity is controlled by applying EGLS specification.

Next, we divide the data into five sectors for industrial comparison. The fixed and random effect models (based on Hausman test) are the applied on the individual industry to find the difference of relationship between capital structure and firm performance across industries. The results reported in table 6 (Panel A) show that both STDA and LTDA have a significant and negative impact on the ROA; however, the magnitude of this negative impact differences across the selected industries. A higher negative impact of leverage is found

*Table 5:*
**Regression Analysis – Full sample**

| Variables | ROA | ROE | TQ | PE |
|---|---|---|---|---|
| STDA | -4.234* | -6.793*** | 2.326 | 0.326 |
| | (5.326) | (2.398) | (2.659) | (0.269) |
| LTDA | -6.982* | -15.432** | 1.235* | -3.597** |
| | (9.236) | (6.598) | (3.267) | (5.659) |
| DTER | 0.004 | -3.234* | -9.569** | 2.365 |
| | (0.569) | (8.957) | (5.659) | (8.592) |
| OR | -0.021 | -1.324 | 2.365 | -2.033** |
| | (0.659) | (2.659) | (3.269) | (3.896) |
| ATR | 6.571* | 13.976* | 0.268 | -0.569* |
| | (9.896) | (5.859) | (1.598) | (2.497) |
| GROWTH | -4.359** | -2.567* | -7.653* | -2.698* |
| | (5.659) | (5.874) | (6.238) | (5.649) |
| SIZE | 0.091 | 3.264* | -6.256 | 2.569*** |
| | (0.896) | (2.369) | (2.897) | (7.985) |
| R-Square | 0.761 | 0.469 | 0.296 | 0.194 |
| Durbin-Watson | 1.122 | 1.326 | 2.269 | 1.236 |

**Note**: *, **, *** indicates significant coefficient at 1, 5 and 10 percent respectively. Values in parenthesis represent t-statistics.

for Chemical and Cement industries while it is lower in case of Textile industry. A possible reason for the later is that Textile industry of Pakistan is a well establish business sector and also have a higher number of companies in our sample. DTER is only significant in Chemical and Food sector at 10% level of significance. The DTER coefficients are very low indicating a small impact on ROA. The R-square value is highest (65%) for Energy sector and lowest (11%) for the Food sector.

Panel B shows the industry-level regression results when the performance is measured by ROE. The STDA has no impact on the ROE for all the industries. LTDA has a significant negative (positive) impact on ROE for Textile, Food and Fuel (Chemical) industries. Similarly, DTER has a significant negative impact on the ROE, except for the Energy sector. Operating risk is negatively related with ROE for the Textile sector implying that a 1% increase in operating risk decreases ROE by 23.6%.

*Table 6:*

**Results of industry-wise regression analysis**

| Variables | Textile | Chemical | Cement | Food | Fuel & Energy |
|---|---|---|---|---|---|
| ***Panel A:*** *Performance measured by ROA – Equation (1)* | | | | | |
| STDA | -4.295*** | -7.596*** | -7.653*** | -8.236** | -5.236*** |
| LTDA | -7.594*** | -13.569*** | -15.236*** | -8.236*** | -8.563*** |
| DTER | -0.059 | -0.265** | -1.236 | 0.265** | 0.213 |
| OR | 0.049 | -0.235 | 0.023 | -0.326*** | -0.269 |
| ATR | 6.598*** | 9.043*** | 6.329* | 5.226** | 5.233*** |
| GROWTH | 0.268*** | 1.236*** | 0.059 | 0.235 | -4.569** |
| SIZE | 2.126*** | 0.956*** | -0.322* | 0.659*** | 0.235 |
| R Square | 0.531 | 0.292 | 0.798 | 0.135 | 0.654 |
| D-W stats | 1.635 | 1.796 | 1.569 | 1.436 | 1.865 |
| ***Panel B:*** *Performance measured by ROE – Equation (2)* | | | | | |
| STDA | -7.569 | 4.569 | -2.326 | 7.659 | -26.326 |
| LTDA | -34.596*** | 11.236** | 13.236 | -29.236*** | -16.236*** |
| DTER | -3.236 | -15.236*** | -4.236** | -3.236*** | 0.326* |
| OR | -0.236*** | 0.235 | 1.326 | 17.236 | -0.626 |
| ATR | 14.236*** | 11.236*** | 5.236 | 15.236 | 5.236 |
| GROWTH | 0.235 | -0.043*** | 0.326 | -0.236 | 23.266 |
| SIZE | 4.326 | 1.236 | 0.236 | 5.659 | 12.326 |
| R Square | 0.213 | 0.369 | 0.265 | 0.176 | 0.098 |
| D-W stats | 2.156 | 1.456 | 1.962 | 2.326 | 2.563 |
| ***Panel C:*** *Performance measured by TQ – Equation (3)* | | | | | |
| STDA | 0.398*** | -0.956 | 0.326 | 0.326 | -9.326*** |
| LTDA | 0.239*** | 3.569 | 2.322* | 1.236*** | -6.326** |
| DTER | 0.323 | 0.056* | 0.236 | 0.236** | -0.063** |
| OR | -0.569 | 0.065*** | -0.236 | -0.032** | 2.236 |
| ATR | 0.563 | 3.329 | 4.236*** | 0.322 | -0.623 |
| GROWTH | 0.036 | -0.232* | -0.013 | 0.032 | 0.232* |
| SIZE | -0.056*** | -0.326 | 0.059 | 0.036 | -0.236 |
| R- Square | 0.453 | 0.049 | 0.326 | 0.059 | 0.653 |
| D-W | 1.846 | 1.965 | 1.546 | 1.326 | 1.765 |
| ***Panel D:*** *Performance measured by PE – Equation (4)* | | | | | |
| STDA | -4.653*** | 2.659 | 2.569 | -4.659* | 7.598** |
| LTDA | -16.233*** | -3.569 | -3.569 | -3.326* | 4.569 |
| DTER | 0.035 | 0.065 | -1.236 | 0.236 | 0.235** |
| OR | 0.068 | -0.059* | 0.089 | 0.098 | -1.256** |
| ATR | -8.569*** | 5.264*** | 6.329* | 4.569*** | 2.235 |
| GROWTH | 0.032 | 0.035 | -0.036 | -1.236*** | -3.659*** |
| SIZE | 0.865 | -0.059 | -1.236* | 0.798*** | 0.598 |
| R- Square | 0.029 | 0.027 | 0.234 | 0.098 | 0.279 |
| D-W | 1.326 | 2.194 | 2.446 | 2.465 | 1.564 |

Note: ***, **, * indicates significant coefficient at 1, 5 and 10 percent respectively. D-W stands for Durbin–Watson test of serial correlation in the residuals.

Panel C presents the regression results when the performance is measured by Tobin's Q. STDA is significantly and positively related with TQ of Textile sector, whereas STDA, LTDA and DTER have a significant negative impact on TQ for Fuel and Energy sector. OR has a negative (at 5% level of significance) impact on TQ for the Food sector. There is a significant positive relation between ATR and TQ for three sectors. R-square is below 50% for all industries which implies that the variables have a low explaining power when the TQ is used as a performance measure. The results of industry-wise regression analysis using PE as the performance measure are reported in the

Panel D of Table 5. Again, STDA and LTDA have a significant negative impact on the PE for Textile and Food sectors. In case of Energy sector, STDA and DTER have a significant positive impact on PE. The Durbin-Watson statistics show that there is no problem of autocorrelation.

It can be argued that the tax benefits associated with debt financing lead the firms to borrow excessively and in doing so the firms often ignore the bankruptcy costs associated with increasing debt and declining returns. When the firms diverge from a desired capital structure, the bankruptcy costs outweigh the tax benefits and hence decrease the performance (Zeitun and Tian, 2007). According to pecking order and trade-off theory, the primary concern of companies should be to finance the operations through retained earnings with an appropriate trade-off between tax shield and bankruptcy cost. Companies with higher profitability are most likely to use retained earnings and less amount of debt finance implying a negative relationship between the firms' performance and higher debt levels. In line with the findings of Bandyopadhyay and Barua (2016), we find that industry-wise reliance on the debt finance is different and hence the relationship between financial performance and higher debt levels is also different.

## Conclusion

This study examines the association between capital structure decisions and corporate financial performance at industry-level for companies listed on Karachi Stock Exchange of Pakistan. We utilize a broad panel data comprising of 213 companies for the period 1999-2015. Unlike the existing literature that mainly explored individual sectors and used limited number of variables, a comprehensive set of financial performance and capital structure proxies is examined to provide a complete picture of the said relationship. Fixed and random effect models are considered and best fitted model is applied based on Hausman test.

The empirical results indicate that both short- and long-run debt negatively impact return on assets, return of equity and price to earnings ratios. The impact of capital structure proxies on Tobin's Q is positive for some industries. The higher reliance of Pakistani companies to achieve tax shield decreases their performance due to higher financing and bankruptcy costs. We suggest that the companies' management should pay attention to the negative association between debt financing and financial performance. The capital structure decisions must be made with due consideration to information asymmetry and reply mainly on the retained earnings to finance the new ventures. The policy makers especially the State Bank of Pakistan may take steps to enhance the completion that will results in a free market and easy access to finance in both money and capital markets. The eventual decrease in cost of borrowing resulting from free market will allow companies to borrow at lower cost and hence a better financial performance.

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