Financial Leverage and Firms' Performance: Empirical Evidence from KSE-100 Index

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Abstract. *Capital generation to fund everyday operations and long-term expansions is a constant concerning element in the corporate world. This study aims to investigate the optimal level of capital structure that firms can adopt to improve their financial performance given the industry dynamics and economic circumstances of the country. Using Hausman's specification test, annual data for the period 2005 – 2014 of Karachi Stock Exchange (KSE) 100 index listed securities has been collected to analyze the impact of financial leverage on the firms' performance. Return on assets, return on Equity, and TOBIN's Q are the proxies of financial performance analyzed against financial leverage for the KSE 100 index listed firms. The finding of the paper indicates that capital structure, leverage, interest cover and sales growth as most significant variables impacting firms' profitability.*

Keywords: *financial leverage, Tobin's Q, profitability*

Abstrak. *Pertumbuhan modal untuk mendanai operasional keseharian dan ekspansi jangka panjang adalah elemen konstan di dunia usaha. Penelitian ini bertujuan untuk mengetahui tingkat optimal struktur modal yang dapat diadopsi perusahaan untuk memperbaiki kinerja keuangan mereka mengingat dinamika industri dan keadaan ekonomi suatu negara. Dengan menggunakan uji spesifikasi Hausman, data tahunan untuk indeks saham yang tercatat pada tahun 2005 - 2014 dari Karachi Stock Exchange (KSE) 100 telah dikumpulkan untuk menganalisis pengaruh leverage keuangan terhadap kinerja perusahaan. Return on asset, return on equity dan TOBIN's Q adalah proxy kinerja keuangan yang dianalisis terhadap leverage keuangan untuk perusahaan indeks KSE 100 yang terdaftar. Temuan makalah menunjukkan bahwa struktur modal, leverage, interest cover dan pertumbuhan penjualan sebagai variabel paling signifikan yang mempengaruhi profitabilitas perusahaan.*

Kata Kunci: *leverage keuangan, Tobin's Q, profitabilitas*

Introduction

Advancement in financial markets in which capital can be generated have further complicated the task of generating funds for the executive bodies where the end goal is to optimize performance of the business. Debt and equity being the generic terms used for the sources of capital have grown in its own terms and meanings where debentures, bonds, loans, running finances, ordinary shares, preferred shares and retained earnings are the additional divisions made for these sources. Finance managers are expected to choose the best option for a given resources to be funded and strike the right balance that can reduce cost and increase earnings for the shareholders.

There are different school of thoughts that have presented arguments on the optimal level of leverage that a firm should take. The ideal position can be ascertained by analysing the trade-off amongst the cost of bankruptcy and the tax advantage that firms save through charging of interest expenses (Owolabi and Inyang, 2013). Other historic work of Modigliani and Miller of 1958, which disregards bankruptcy, cost and tax advantage but focus on the risk of leverage that will eventually make shareholders demand more compensation (Abor, 2007).

An investigation on listed firms (KSE 100 index) keeping current trends of leverage and investment between sectors allow a wider view to be taken into consideration. This study is primarily designed to assist financial decision makers however given the sector analysis and trend of 10 years it also allows economists and financial advisors of the country to consider the benefits and drawbacks of leverage. Monetary policy decisions on macro level can take guidance from the results while devising their strategies to dictate spending and investment in the economy. Sectorial developments are also addressed in this paper where all 35 sectors of PSX that is another literature gap found during the preliminary researches.

Time constraints do not allow all listed firms of PSX to be consider that have also taken a leverage position. Leverage is also impacted by other economic variables that are fluctuating in the market, specifically interest rate that is not studied to the full extent. Budget controls do not allow full access of worldwide data and use of primary resources to support the study. Major revenue generation sector in the Pakistan context are Small and Medium Size Firms that are not listed on PSX and does not fall in the area of study. Research gaps in sector analysis may arise due to number of listed firms in the sector against those classified in KSE 100 index. International comparisons are not incorporated with the similar economies to validate the results and its impact.

1 Financial leverage is the degree to which a firm has funded its business operations through outside resourced (Modigliani and Miller, 1958). Leveraged businesses have additional capital available to finance its operations and expansions compared to an unleveraged business solely dependent on equity (Strebulaev & Yang, 2013).

In financial markets there are more institutes that are willing to lend the businesses and less of those who wish to invest. Comparing financial leverage with the market value added of the listed firms conducted in India indicated that the leverage has significant impact on the market value added and the changes in value that occurs overtime (Pandya, 2016).

Capital structure is the ratio between debt to equity that a firm has adopted to finance its fixed and current assets. This structure is also highlighted in the pecking order theory of Myers and Majluf (1984) where businesses upon their past trends of profitability and general business need. Pecking theory focuses on the asymmetry of information where firms are in an imperfect market and the information is linked to the cost. A one percent decline in equity to total capital can result up to ten percent an overall increase in the profitability for US firms excluding the extreme scenarios where leverage levels may result in overall firms' bankruptcy (Berger & Di Patti, 2006). There is a positive relation between capital structure and the firm's market value (Chowdhury and Chowdhury, 2010). Raising capital through debt increases overall base of capital and hence the leverage multiplier allowing firms' to become more profitable (Fosu, 2013). This theory has been further supported by Sen and Heng (2011); Shubita and Alsawalhah (2012).

Negative relationship was revealed between debt and profitability in trading sector firms of France, contradicting the earlier studies where a positive relation has been statistically proven for the listed firms. The study supports agency theory where the relative cost of debt and equity is the key variable used in determining capital structure of the business (Myers and Majulf, 1984). In this case borrowing cost is lower for larger firms compared to small and medium business hence the difference in relationship impact between the two.

The agency theory applicability is further supported in the studies of Margaritis and Psillaki (2010); Berger and Bonaccorsi (2006). Capital structure is negatively related to return on asset and return on capital employed. Furthermore studies conducted in Pakistan (Bokhari and Khan, 2013) and Nigeria (Chechet and Olayiwola, 2014) both had similar conclusion of observing a negative relationship between capital structure and profitability.

Corporate governance or employee turnover are considered important factors to determine its performance over a time period and in comparison with other industry players (Baños-Caballero, et al, 2014). Financial ratios simplifies the analysis where percentages are used to create a relative scenario and nullify the impact of other variables such as size of the firm and production capacity that makes comparison of absolute numbers inaccurate (Niresh and Velnampy, 2014). Return on capital employed, return on total assets, net profit margins are the most popular financial ratios that allow analysis of the firms and judge their performance over a fixed time period (Boadi and Li, 2015).

The returns ratio pictures the efficient use of capital that firm has raised either through debt or equity inclusive of internal earnings. Margins assist in the analysis of firms' operational efficiency and success in terms of the value they were able to add in their products to cover for expenses and return to shareholders (Ge and Kim, 2014). Some ratios and tools are available to study the robustness and sustainability of the business which includes liquidity ratios, interest cover ratios and other similar ratios that further increase the understanding of the true picture that a firm portrays (Ogundipe, et al, 2012).

Literature also supports market value ratios that determine shareholder's position such as Price to Earnings Ratio and Earning per Share that shows investors' confidence in the business operations and plans along with business's capability to payback its investors in the form of

dividends (Kajola, et al, 2015). Significantly good numbers does not necessarily results in long term sustainability of the firm unless the environmental factors are taken into account (Delen, et al, 2013). Firms have to make critical choice of balancing their capital structure; liquidity, solvency, profitability and growth policies to make a positive impression on the industry as a key player that intends to survive and grow within the industry (Muritala, 2012).

Banks are mostly financed by an abundance of short-term debt as the study revealed for Ghana it is around eighty seven percent. All variables of tax, profitability, asset allocation, growth and size of the bank influence the financing strongly which was discovered using panel regression model (Amidu, 2007). The capital structure has an inverse relationship with Returns on Asset but there was no relation found with return on equity in a study conducted for Bangladesh. Pecking order theory was declared as the most applicable for the market (Hasan et. al, 2014). Contradicting result for the study conducted in Pakistan showed the relation between leverage and returns made on assets is positive however with return on equity the impact is negative (Fareed, et al, 2014) however the economic factors of interest rates and tax rates are not considered in either of the study to further validate the results.

Capital structure ratios have no impact on the profitability ratios (EL-Sayed Ebaid, 2009). There are other factors that contribute towards the changes in reported numbers. The same conclusion was also shared by another study of Phillips and Sipahioglu (2004). Profitability and short term debt financing are inversely related for the banking sector firms (Amidu, 2007). However a contradictory result was produced where long-term debt and profitability has inverse relationship and profitability linked to short-term debt are positively related (Abor, 2005). Testing the tax benefits, firms with leverage can avail it was investigated that a negative relationship is consistent with the profitability and leverage ratios (Graham, 2000).

The ideal position of leverage can be determined by analysing the trade-off amongst the cost of bankruptcy and the tax advantage that firms save through charging of interest expenses (Owolabi and Inyang, 2013). Historic work of Modigliani and Miller (1958) that disregards bankruptcy cost and tax advantage but focus on the risk of leverage that will eventually make shareholders demand more compensation (Abor, 2007).

Trade-off theory suggests that firms in a strong form market efficiency with symmetric information can benefit from the tax shield that is provided by the debt capital (Modigliani and Miller, 1963) hence increasing the overall firm's value however the diminishing returns can be set off once the debt burden and cost results in liquidity crisis and a decrease in the value of the firm. Pecking order hypothesis supporting the agency theory developed by Myers and Majluf (1984) state the relative availability and cost of finances dictate firms' decision of capital structure.

Irrelevancy theory speaks about the assumption that a perfect market exists with no added benefits of tax saving or the consequence of bankruptcy. In such case the firm's value remain constant and cheaper debt results in risk exposure that forces shareholders to demand higher dividends. This theory presented by Modigliani and Miller (1958) argues that capital structures are irrelevant and the true performance of the firm is dependent on the revenue generated by its assets.

Baker and Wulgar (2002) introduced the Market timing theory, which related the capital structure to market to book ratio, specifically the historic trends. This theory indicates that the firms change their capital structure over period with attention to the cost of borrowing compared with cost of equity. When the cost of equity is low than the leverage will be reduced and equity financing shall be opted for. When debt cost is low than firms borrow to buy back their own shares altering the capital structure that is more cost effective. New stock is issued when the stock prices are overvalued and buy back takes place when they are undervalued effectively altering the debt to equity proportion maintained by the listed companies.

Theory of leverage discipline is based of free cash flow to the firm theory that ensures that the available cash for debt and equity holders is sufficiently generated from the net income excluding the investment in fixed and working capital (Jensen and Meckling, 1976). Financial decision makers have to ensure that profitable avenues of investment are sought after in enabling the firm to earn sufficient cash flows to pay off the debt holders and shareholders of the company (Owolabi and Inyang, 2013).

The decisions of finance manager to take more leverage for business funding is a signal given in the market that the firm expects to have better cash flow streams and avenues of generating profits with an overall improvement in the performance of the firm. However the issue of equity in the market to raise finances is treated negatively by the shareholders giving way to the assumption that the stock prices are overvalued and company is using its least appropriate sources of finance indicating lesser opportunities being available for business growth and improvement in performance variables.

The research question that addressed in this paper is: first, what is the degree of impact of listed firms' leverage on their performance? Second, is the relationship between leverage and performance consistent? Third, what differences are identifiable in different sectors on leverage and performance relation? Fourth, are there more than one suitable combinations of debt to equity that firms can optimize their performance?

Method

To reveal the effect of financial leverage on firm's performance, the estimation procedure used by Mules and Mudras (2015) taking the legacy work of Wellalage and Locke (2012) is adopted as:

$$ROA_{it} = \beta_{01} + \beta_{11} LEV_{it} + \beta_{12} SG_{it} + \beta_{13} TATA_{it} + \beta_{14} CS_{it} + \beta_{15} IC_{it} + \varepsilon_{it} \qquad (1)$$

$$ROE_{it} = \beta_{01} + \beta_{21} LEV_{it} + \beta_{22} SG_{it} + \beta_{23} TATA_{it} + \beta_{24} CS_{it} + \beta_{25} IC_{it} + \varepsilon_{it} \qquad (2)$$

$$TOBIN\,'SQ_{it} = \beta_{03} + \beta_{31} LEV_{it} + \beta_{32} SG_{it} + \beta_{33} TATA_{it} + \beta_{34} CS_{it} + \beta_{35} IC_{it} + \varepsilon_{it} \qquad (3)$$

$$\varepsilon_{it} \sim N(0, \sigma^2)$$

Where ROE_{it}: ratio of net earnings divided to equity in book value for firm i in period t representing financial performance of firms listed at the PSX 100.

ROA_{it}: is the ratio of pre-tax profits to total assets for firm i in period t. This represents financial performance of firms listed at the PSX 100.

TOBIN'SQ$_{it}$: is the ratio of market capitalization to book value of assets for firm i in period t. This too represents financial performance of firms listed at the PSX.

LEV$_{it}$: is the ratio of total debt to total capital for firm i in period t, representing financial leverage of firms listed at the PSX.

SG$_{it}$: is the percentage change in sales revenue of the firm i in period t, representing the growth of firms' sales on PSX 100.

TATA$_{it}$: refers to asset tangibility defined as the ratio of the fixed tangible assets divided by the total assets for firm i in period t.

IC$_{it}$: refers to Earnings before Interest and Taxes (EBIT) divided by the interest expense for the period t of the firm i, representing the interest cover and indicating solvency of the firm and ability to pay its debt expenses.

CS$_{it}$: refers to the ratio of Total Debt to Total Common Equity of the firm i for the period

Results and Discussion

For panel data the adopted technique for unit root testing was Levin, Lin and Chu, Augmented Dickey Fuller (ADF) and Phillip Perron (PP) alongside Newey-West bandwidth selection has been applied to address the normality, multicollinearity, hetroskedasticity and autocorrelation in data. Table 1 indicate that the five independent variables except TATA$_{it}$ has no unit root at level I(0) where the order of integration is zero. TATA$_{it}$ has Unit Root at I(0) where the probability is greater than 0.05. However at first order of integration I(1) there is no unit root and data for variable TATA$_{it}$ and it is stationary after performing a differentiation technique.

Table 1. Unit Root Test

Variables	Level Order of Integration I(0)			First Order of Integration I(1)		
	Levin, Lin & Chu	ADF	PP	Levin, Lin & Chu	ADF	PP
Financial Leverage (LEV)	-7.78588 (0.0000)	132.541 (0.0001)	206.466 (0.0000)	-	-	-
Sales Growth (SG)	-48.8111 (0.0000)	163.207 (0.0000)	245.113 (0.0000)	-	-	-
Tangibility (TATA)	-1.16686 (0.1216)	39.7299 (0.9926)	39.8724 (0.9922)	-32.7506 (0.0000)	220.340 (0.0000)	373.811 (0.0000)
Capital Structure (CS)	-4.65172 (0.0000)	109.509 (0.0108)	182.437 (0.0000)	-	-	-
Interest Cover (IC)	-8.87836 (0.0000)	160.155 (0.0000)	200.798 (0.0000)	-	-	-
Return on Equity (ROE)	-6.68435 (0.0000)	146.107 (0.0000)	132.144 (0.0004)	-	-	-
Return on Assets (ROA)	-6.28409 (0.0000)	149.587 (0.0000)	146.857 (0.0000)	-	-	-
TOBIN's Q	-3.39771 (0.0003)	97.9325 (0.1107)	166.393 (0.0000)	-	-	-

This table shows the random walk behaviour of variables (series) using summary of unit root for Panel Data.

For the three Dependent variables namely return on assets, return on equity and TOBIN's Q. All variables have stationary data at the level order of integration I(0). Only variable representing tangibility is differentiated as shown in the table above where all other variables were qualifying for I(0).

The dependent variables in the equation and their relation with the independent variables were tested in panel data analysis utilizing the random effect model. With conducting Hausman specification test for fixed and random effect it was discovered that all dependent variables have probability of chi-Square greater than 0.05. $TATA_{it}$ was adjusted at first level of integration applying differentiation to make data stationary as noted in unit root test. Table 2 shows the probability of chi-square indicating the Hausman results.

Table 2. Hausman Specification Test

Dependent Variable	Chi-Square Statistics	Probability
ROA	0.482344	0.9928
ROE	2.156483	0.8271
TOBIN's Q	7.348427	0.1960

This table shows the results of Hausman Specification Test which specifies either random effect or fixed effect model is the most appropriate.

In random effect model ROA is significantly impacted by Debt to Capital and Interest Cover where the former has a negative relationship and later having a positive relation. The respective beta and probability are shown in the Table 3. Return on equity also has two significantly impacting variables, Debt to Equity and Interest cover. Similar to ROA it has a negative relationship with the capital structure and positive with the interest cover. TOBIN's Q has the most contrasting result from ROA and ROE. It has two significant variables impacting its value, Debt to Capital that indicates leverage and sales growth of the firm. Both are negatively related to TOBIN's Q with the impact on book value of assets that increases more than the market capitalization of the firm.

Table 3. Panel Least Square

	ROA		ROE		Tobin's Q	
	Coef	t-stat	Coef	t-stat	Coef	t-stat
Const.	0.173	14.598	0.254	7.215	0.844	10.190
debt to Capital (DC)	-0.191	-5.371	0.021	0.205	-0.937	-3.755
debt to equity (DE)	-0.001	-1.566	-0.328	105.7	-0.005	-0.767
tangible assets to total assets (DTATA)	0.026	0.137	0.105	0.182	-1.472	-1.085
interest cover (IC)	0.000	5.008	0.000	2.171	0.000	0.828
sales growth (SG)	0.004	1.315	0.017	1.830	-0.080	-3.609

Return on Asset has a strong negative relation with leverage of the firms. Similar negative relation is also found in the capital structure composition of ROA but the degree of

impact is not high. Return on Equity has a positive relation with all independent variables except capital structure. An inverse relation with the capital composition of debt to equity is visible which is also the strongest factor impacting ROE amongst others.

TOBIN's Q analyses market capitalization to the assets book value reported by the firm. Interest Cover has a positive relation with TOBIN's Q whereas all other independent variables show a negative relation specially tangibility where the Beta coefficient is relatively high but has statistically low significance along with the leverage coefficients which also has a significant impact. Panel EGLS also known as Random or Fixed Effect model is applied for multivariate panel regression, results are shown Table 4.

The relationship between dependent and independent variables are the same for Panel EGLS as found in Panel Least Square. The significant regressors are also similar as highlighted in the table above. This analysis further shows a realistic picture of the firms' performance. Adjusted R^2 was analysed in the two tests where Panel Least Square shows that the chosen set of independent variables based on literature review are sufficient for analysis, it is revealed in the Panel EGLS that only ROE with adjusted R^2 of 0.9704 is the dependent variable that takes impact from the selected leverage variables as independent factors. The value of R^2 is less than 0.60 for ROA and TOBIN's Q that means that for KSE 100 index other variables for the listed firms are to be included for conducting regression analysis. Overall, data analysis shows that the Debt to Equity factor representing the capital structure of the firm and Interest Cover showing the ability of the firm to pay its interest expense are the most significant variables of the study impacting the profitability of the firms. For Return on Assets, firms should pay high importance to the capital structure they are opting for and simultaneously their ability to cover interest expenses.

Table 4 Panel EGLS

	ROA		ROE		Tobin's Q	
	Coef	t-stat	Coef	t-stat	Coef	t-stat
Const.	0.175	10.964	0.232	6.199	0.868	6.332
debt to Capital (DC)	-0.199	-6.449	0.100	1.220	-1.014	-4.440
debt to equity (DE)	-0.002	-1.592	-0.329	107.5	-0.004	-0.614
tangible assets to total assets (DTATA)	0.028	0.147	0.069	0.120	-1.504	-1.110
interest cover (IC)	0.001	5.117	0.001	2.136	0.001	0.766
sales growth (SG)	0.004	1.336	0.017	1.769	-0.076	-3.445

Capital structure is showing a negative relationship with the Returns on Assets which indicates that listed firms when increasing the overall capital base may also consider full utilization of the additional resources. This conclusion is supported by literature with studies showing negative relationship (Hasan et. al, 2014; Bokhari and Khan, 2013; and; Chechet and Olayiwola, 2014). Capital generated from leverage may not have the desired growth in earnings as firms also need to bear interest cost which is high in the initial years compared

to later. Capital generation from equity also increases the capital base where total assets are significantly higher in value resulting in lowering of Return on Asset. Interest cover on the other hand indicates a positive relationship with Return on Assets with the common factor being the net earnings. Any increase in earnings improves interest cover and return on assets hence the positive link is justified.

Return on equity is impacted by the leverage ratio of debt to capital where a negative relationship is present that indicates increase in leverage may reduce the returns generated by the firm on its equity. Literature supports these findings in studies of EL-Sayed Ebaid (2009); Hasan et al (2014); Fareed, et al (2014); Bokhari and Khan (2013); Chechet and Olayiwola (2014). The case of leverage resulting in extra cost to the firm and gradually increasing the revenue is applicable. Many firms in PSX market are still in their growth phase hence the extra capital is utilized in fixed assets where the earnings are long term in nature compared to investment in marketable securities or other investments that can generate higher profits for the listed companies. On the contrary interest cover and return on equity are also significantly related in a positive relation where increase in one factor result in increase of the other. It is also impending when interest cost reduces than the returns generated can significantly improve where finance cost is a significant impact for leveraged companies.

Tobin's Q signifies the market capitalization of the business to its book value of assets. There are firms that have high capitalization even though the actual book value of assets is not massive. This indicates that the investor's trust in the company and its business model is increase the share price and free float in the market resulting in high capitalization. The capital structure of the business and sales growth are the two significant variables impacting Tobin's Q both negatively related. Increase in capital structure for listed firms translate into an increment of book value of assets that the firm shoes in its financial records. The changes in market capitalization is much more stagnant hence the Tobin's Q factor reduces. With respect to sales growth the lag of results being announced and the actual capitalization results in the negative relationship where the growth in book value of assets is significantly higher than the market capitalization. Low Tobin's Q indicate the firm's market presence is reflective of its actual performance whereas an exaggerated value may show overpricing of the stock may be a result of speculation or excessive demand of the securities.

Conclusion

In the analysis of firms listed in Pakistan Stock Exchange KSE 100 index, many firms were new with less than 10 years of financial information. Furthermore many firms were found that were trading successfully with no debt position. Basing the study on the leverage and profitability only firms with considerable debt to capital ratios were analysed all belonging to non-financial sector where the analysis is precise on statistically proving the leverage variables selected in the study as significant or non-significant to the profitability of the firm. Panel data was collated including companies from various non-financial sectors with financial records of ten years or more.

Further studies can be carried on the basis of this paper where further enhanced variables of leverage can be added along with the analysis on profitability factors that are closer to business operations. In this paper the assets of the firm and capital composition is the main focus. Moreover the data for KSE All index can be taken to deepen the analysis along with a thorough comparison of sectors. This study did not include financial firm as the asset base and capital base is different from the non-financial businesses. The contrast can be studied for providing analysis for the investors and financial managers in aiding decision-making.

It is recommended on the basis of the above analysis that leverage firms should closely monitor their finance cost and ensue that the additional capital brought in the business is effectively utilize. The returns generated are not growing at the same pace as the cost and assets of the company. However investors should realize that sales growth and leverage shall bring the market value of the firm closer to its book value which means that the stock market shows a more realistic position of the company behind the stock.

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