
Determinants Of Capital Structure - Evidence From Oil And Gas Tradable Sector Index (Ogti) Of Pakistan Stock Exchange

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Abstract: *financing decisions are one of the most vital decisions for companies. the given study investigates the influence of capital structure on the stock return in the context of oil and gas segment of pakistan. analysis have been conducted on 10 oil and gas companies operating in pakistan stock exchange on the basis of market capitalization over the period of 2013 to 2018.ordinary least square, fixed effect and random effect estimation methods used in the study. this study identifies the factors size, growth, non-debt tax shields, profitability, and tangibility which are important in choosing optimum capital structure. these factors are independent variables, while financial leverage is the dependent variable. results found that non-debt tax shields and profitability have the negative relationship and size, tangibility and growth have the positive relationship with the financial leverage. however, the results for size and tangibility are not statistically significant. profitability shows the negative sign and statistically significant so it may be concluded that the profitability and financial leverage are negatively related. growth is positively related with financial leverage and it is also statistically significant so hypothesis regarding growth is accepted and concludes that there is positive relationship between growth and financial leverage of the listed oil and gas firms of pakistan and follows the pecking order hypothesis. this research study is based on the data taken from the state bank of pakistan publication balance sheet of oil and gas sector companies listed on the pakistan stock exchange.*

key words: *capital structure, financial leverage, panel data, pakistan stock exchange.*

1. INTRODUCTION

The decision of the optimal structure of capital is a controversial issue in the area of corporate finance. The optimal structure of capital can be defined as the method by which the operations of a company are financed. The companies usually use different sources of funds for their activities. There are mainly two sources which include equity and debt. Debt can be obtained through long-term notes or issuance of bonds whereas there are three sources of equity that include preferred stocks, retained earnings, and common stock. The weighted

average of both types of financing is the cost of acquiring funds. The cost of debt involves the risk of default whereas the cost of equity involves the risk of the investment which is being invested by the investors. The discussion of capital structure determinant is old in the corporate world. Some factors are used for deciding the capital structure of the firms. These factors are intangible and tangible. Many financial experts have tried to explore the different attributes that can impact the capital structure of the firm and that can enable the managers to make the optimal decision in selecting the most effective capital structure.

In the study of Modigliani and Miller (1958), it is indicated that the earning power of the firms and the underlying risks of the assets determines the market value of a firm. There are three methods of financing that are available to firms which include spending profits, borrowing, and the issuance of shares. The underlying theory gets more complicated. The general assumption is that it does not make any difference whether an organization opts for equity financing or debt financing. This theory has many unrealistic assumptions, but it provides theoretical support for conducting future research work. After a number of researches undertaken in the area of the optimal structure, the three main theories had emerged that is a signaling theory, pecking order theory, and tradeoff theory.

In Pakistan the firm's capital structure is generally decided by the funds available in the financial sector of the country. The domestic savings are comparatively low and cannot be used to finance different segments of the economy (Rummana Z., et al., 2021). The economy, therefore, is highly dependent on the debts acquired by international sources. Thus due to this, the capital structure determinants change overtime on the basis of the funds available to the economy (Ali, S. R., 2020). This study is aimed at covering each area of the capital structure but has a special focus on the capital structure of the oil and gas firms of Pakistan listed in PSE (Pakistan Stock Exchange). The study has explored a number of factors that can influence the capital structure determinants and therefore can manipulate the financial decision-making of the company.

The oil and gas sector is an important contributor to Pakistan's economy. The sector plays a key role in boosting the economy. The key performance indicators of the sector were not much encouraging in the year 2018 concerning profitability ratio and earnings ratios. In 2018 the return on equity has fallen from 26.91 to 21.35 and the return on the asset has declined from 10.25 to 8.17. Net profit margin showed better results that they increased from 12.18 to 12.72 in 2018. There was a decline in the financial leverage sector that is from 2.63 to 2.31. The first study on the subject matter was conducted by Sarmad Ali (2017) in which the period of 2005 to 2014 was used and regression OLS and correlation models were used for analysis. The study was based on the period of ten years before the three stock exchanges that are Islamabad Stock exchange (ISE), Lahore Stock exchange (LSE), Karachi Stock Exchange (KSE) were marginalized which later merged into Pakistan Stock Exchange after the act of 2012. This research has used updated data that is from 2013 to 2018. The methods that are used are random and fixed effect estimation model and ordinary least square method. The different method of analysis and the use of additional variables has made the study more important in this area of research.

There are three contributions of this study to the literature. It provides great evidence about the puzzle of a capital structure operating in the Pakistan Stock Exchange. It also uses different methods to analyze capital structure determinants and also it fills the gap of new data set of the companies operating in the oil and gas sector of Pakistan. Thus this study will contribute towards providing insight about the change in the capital structure of listed firms are the merger of three stock exchanges.

This study is focused on four objectives.

- To identify the major capital structure determinants
- To analyze the variables having a significant influence on the sector's financial leverage
- To explain the relationship between capital structure determinants and financial leverage
- To provide a suggestion for some determinants that need to be considered for capital structure decision

2. LITERATURE REVIEW

There are an immense literature on the optimal structure of capital and its significance to the organization. De Miguel, et.al, (2001), examined the characteristics of firms that serve as the capital structure determinants. The study used different explanatory theories and the effect of institutional characteristics on capital structure. This highlighted that the Spanish firms bear the low cost as compared to that of US firms. The results of the study indicated the interdependence between the financing decision and investment. Furthermore, the results were also founded to be consistent with financial distress and tax theories. The study also provides additional evidence on the free cash flow theories and the pecking order. It was concluded that the institutional characteristics have some impact on the capital structure of the firm.

Guha-Khasnobis, B. et.al, (2002), investigated the determinants of the capital structure of the firms operating in developing countries like India by using dynamic panel model. Results confirms that the readjusting cost is optimal for an optimal capital structure. The study further identified the main determinants of the adjustment speed towards the optimal capital structure. The study also highlighted the significant differences that are indicated across the cohorts that were formed on the basis of the specific attributes of the firm.

Bauer, P. (2004) conducted the research work on the listed companies in the Czech Republic to analyze the determinants of capital structure by using the data from 2000 to 2001. The Czech firms depicted relatively low leverage as has been observed in the book value. However, if they are measured in the context of market value it is relatively high. The results of the study showed that the firm leverage is negatively correlated with tangibility and profitability but it is positively correlated with size. Also, a negative relationship was observed between the growth opportunities and the leverage when measured in market value. Leverage was also found to be negatively correlated with the non-debt tax shields and is positively correlated with the tax although it has a lower level of statistical significance. This study has also highlighted the significance of the relationship between industry classification and leverage.

Eesomsak, et.al, (2004) investigated the determinants of the capital structure of the firms operating in Australia, Malaysia, Thailand and Singapore with different institutional, financial, and legal environment. The study indicated that the environment plays a significant role in determining the capital structure decision of the firms. The study further highlighted the diverse and significant impact of the financial crisis of 1997 on the capital structure of the firms operating in different countries.

Hijaz, S.T. et.al, (2006) analyze the capital structure of the listed firms operating in the cement industry of Pakistan. The study used the data of 16 firms out of 22 firms from 1997 to 2001. The study took into consideration four independent variables that are the tangibility of assets, firm size (measured by sales natural log), growth and profitability, and their impact on

firms' leverage. The pooled regression results were found highly significant except for the size of the firm.

Psillaki, M., et.al, (2009) studied the determinants of the capital structure of French, Portuguese, Greek, and Italian SMEs (small and medium-sized firms) were analyzed. The results indicated that leverage and size are positively related to each other. Whereas the relationship that exists between asset structure, risk, profitability, and leverage is negative. It was further observed that in any of the four countries, growth is not a significant determinant of leverage. The similarities that are found can be attributed to the financial and institutional characteristics of the country. The similarities also exist due to the common element of their law system. However, due to the difference in the size of the regressions of coefficient, there exists a structural difference. These differences are also due to the specific effects of the firms. The study, therefore, concluded that the capital structure choice in SMEs is due to the firm's specific characteristics rather than the company's specific characteristics.

Afza Talat et.al., (2011), examined the industry-specific attributes and determinants of the firms operating in the Cable and Electrical goods, Automobile, and Engineering sectors. For determining the capital structure, this study conducted a data regression model on the sample of 8 Engineering firms, 7 Cable and Electrical Goods, and 22 Automobile firms. As a proxy for leverage, the debt to asset ratio was used. The empirical results indicate that the firms with large depreciation allowances and good liquidity used retained earnings. The firms also used debt financing for smooth operations and growth. The study further indicated that the firms considered equity financing as their last option. The results of the study supported two related theories that are the Pecking Order Theory and the Static Tradeoff theory.

Afzal Talat et.al (2011), investigate the determinants of the capital structure of 26 Automobile firms operating in the Automobile sector of Pakistan were selected. The study used a pooled data regression model and used cost of debt variables and liquidity variables which were used first time in any of Pakistan's. The result confirms that larger firms which have a good asset structure should adopt debt financing. The results were found to be statistically significant with the liquidity, profitability, and taxes. The results also consistent with the Pecking Order and Static Trade-off Theory.

Ahmed, F et.al, (2011) used panel data for determining the determinants of capital structure and the related influence of the explanatory variables. The study also found consistent with the Static Trade-off theory and the Pecking Order Theory. The study was carried in the non-financial sector of Pakistan. The variables used in the study include non-debt tax shield, size, profitability, the tangibility of assets, and growth. The three new variables were payout, liquidity, and tax. Altogether 336 non-financial firms were selected and the period of five years from 2005 to 2009. Fixed effect random model regression was used for analyzing the significance of variables on the determinants of capital structure. The five variables (tangibility of assets, size, payout, non-debt tax shield, and liquidity) were found to be statistically significant to leverage. The remaining three variables were not found to be statistically significant with the leverage. Thus the study concluded that liquidity, industry type and payout ratio play a significant role in determining the capital structure of the firm whereas tax was noticed to be an insignificant factor in this context

In the study of Zaheer, Z. (2011), the data of 172 companies operating in the textile sector of Pakistan was analyzed to investigate the determinants of capital structure. The study considered the variables keeping in consideration Pakistan's economic climate and its impact on the textile sector. The results indicated that the asset structure and the firm size significantly influence the capital structure of the textile firm in a positive manner. The firms that are larger can attain more tangible assets and debt. However, their risk can be minimized

by the fact that they have the capability to recover the borrowed capital easily without significantly affecting the activities of the business.

Ahmad, H (2013) analyzed co-determinants of capital structure and stock returns by using a structural model. In the study, 100 non-financial firms were selected and the dataset for the period of 2006 to 2010 was analyzed by using the generalized method of moments model (GMM). As per the results, it was observed that both the leverage and stock returns affect each other. However, the effect of leverage is more dominant than that of stock return. Also, it was indicated that liquidity, growth, and profitability are the important determinants of the stock return and leverage. Profitability has a positive effect on stock return and has a negative effect on leverage. It was further observed that on stock return and leverage, liquidity has a negative effect whereas growth has a positive effect. The firm size does not seem to be an important factor and does not have a significant effect on either stock returns or capital structure.

Mumtaz, R. et. al, (2013) highlighted that a firm's choice of debt to equity is highly dependent upon the bankruptcy cost and the related transactions. The equity/Debt ratio is used for measuring the capital structure. Other ratios such as Earning Ration, Earning per share, Return on equity, Return on Asset, Operating margin, are generally used as proxies for measuring the performance of the firm. From the KSE index, this study selected 83 companies, the results confirms that the capital structure and the market value of the firm share a negative relationship.

Saeed, M. et.al, (2013) investigated the capital structure and its impact on the performance of the banking firms of Pakistan using the data from 2007 to 2011. For estimating the relationship between banking performance and capital structure, multiple regression models were used. The study indicated that the performance of the banks can be measure through earnings per share, return on equity, and returns on assets. The determinants of capital structure in the study were found to be long term and short term debt to capital ratio including total capital ratio debt. The results of the study concluded that there is a positive relationship between the performance of the firms of the banking industry and the determinants of capital structure.

Agha, H. (2015) investigated the determinants of Capital Structure and their relationship with the firms of the cement industry listed in the Stock Exchange of Pakistan. This study, 18 firms out of 22 firms were selected from the Pakistan Stock Exchange. The period of 2008 to 2013 was selected for analyzing the data of the firm by utilizing the panel least square method of regression. This further indicates that the debt ratio and variables have an inverse relationship. Further, variables such as growth and tax were also found significant with a positive relationship with the debt ratio. The three variables are dividend, tangibility, and size are not significantly related to the debt ratio. This means that an increase or decrease in the variables would not have any impact on the debt ratio.

Tahir, S.H et.al, (2016) investigated the financial model and its relationship with the capital structure that is adopted by the textile firms listed on Karachi Stock Exchange. The data was taken from the year 2009 to 2013 of the 8 listed firms. The study used a pooled regression model to analyze the results. The results indicated that the Pecking order theory and Static Tradeoff theory are related to the capital structure of the textile firms operating in Pakistan. Also, it was analyzed that the financing patterns of firms support the Pecking Order theory and Static Trade-off Theory.

Shah, M.H., et.al,(2017) investigated the factors that can determine the capital structure of the firms operating in the non-financial sector of Pakistan by using the data from 2005 to 2014. An attempt was made to investigate the impact of liquidity, non-debt tax shield, profitability, tangibility, and size on the capital structure of the selected firms. The panel estimation

method confirms that the leverage ratio has an inverse relationship with the current ratio and profitability of the firm. Whereas, non-debt tax shield, tangibility, and firm size have a positive relationship with the leverage ratio. The liquidity, non-tax shields, and tangibility influence are strongly significant whereas the profitability influence is weakly significant.

Iqbal, F., (2019) highlighted that the MNCs of Pakistan are usually financed with themix of equity and internal debt that they received from their parent corporations. This study analyzed the MNCs listed on the Karachi Stock exchange using the panel data from 2005 to 2017. Results confirms that other than the traditional determinants such as tangibility, non-debt tax shield, size and profitability of the firm, there are certain international factors such as agency cost, exchange rate, and political risk can havean impact on the capital structure decision making of MNCs.

Gharaibeh, O. et.al, (2020) examined the determinants of the capital structure of service companies of Jordan by using the data from 2014 to 2018. Panel regression approach was used to analyze the secondary data of 45 companies. The results of the study conclude that the profitability, size, non-tax shields, business risk, and institutional ownership all factors bear significant impact in shaping the capital structure of Jordan service companies.

Tripathy, S.et.al, (2020) examined the relationship between leverage and the financial performance of the firms listed in BSE. The data set of 56 listed firms was analyzed from 2000 to 2018. The study used a random-effects model, pooled OLS, and a fixed-effect model. Results confirm that there is a significant positive relationship between firm performance and leverage.

3. DATA AND METHODOLOGY

This study used the panel data from 2013 to 2018 of 10 listed oil and gas companies. The data was collected from the Pakistan Stock Exchange. This study used panel data analysis to study the behaviors of these companies across each other over a long period of time. For this research work OLS regression, descriptive analysis, and correlation analysis has been used. The study has also used fixed and random models for in depth analysis.

3.1 Empirical Model

The financial leverage has been selected as dependent variable and size, non-debt tax shield, growth, tangibility and profitability have been taken as the independent variables for the model. The data description is presented in appendix.

3.2 Model Identification

$$FL = \beta_0 + \beta_1(TA) + \beta_2(SZ) + \beta_3(GR) + \beta_4(PF) + \beta_5(NDTS) + \varepsilon$$

Where

FL = Leverage

TA = Tangibility of assets

SZ = Firm Size

GR = Growth

PF = Profitability

NDTS= Non-debt tax shield

β_1 = Coefficient of Tangibility of assets

β_2 = Coefficient of Firm Size

β_3 = Coefficient of Growth
 β_4 = Coefficient of Profitability
 β_5 = Coefficient of Non-debt tax shield
 ε = Error term

3.3 Hypothesis

H₀₁: There is an insignificant relationship between firm size and financial leverage.
H₀₂: There is an insignificant relationship between growth and financial leverage.
H₀₃: There is an insignificant relationship between profitability and financial leverage.
H₀₄: There is insignificant relation between the non-debt tax shields and financial leverage.
H₀₅: There is an insignificant relationship between the tangibility of assets and financial leverage.

3.4 Estimation Methods

Judge et al (1980) have provided guidance regarding the data framework and the related surroundings including the correlation between the independent variables and the error terms. In the situation where the regressors and error terms are not correlated, the random effect model might be appropriate. However, correlation, the fixed effect model is suitable. Hausman specification test can be used for deciding which method is more appropriate for a given case. Amongst the econometricians, the random effect model seems to be more suitable in the situation where the sample is drawn on a random basis from a larger population set. The null hypothesis is therefore an error term in random effects that are not related to the regressions. As per the null hypothesis, there is no correlation between the individual special effects with other variables of the model. Thus, it can be said that in the case of the Hausman test if there is no correlation between the error term and the regressors then there exists no dissimilarity between any method that is random or fixed.

Ho: U_i not correlated with X_{it}

H1: U_i correlate with X_{it}

The random effects would be efficient and steady under the null hypothesis, which means that the null hypothesis is true. But given the alternate hypothesis, there would be varying random effects. The fixed-effect model remains stable irrespective of the fact that the null hypothesis is true or not. Thus the alternative hypothesis would be accepted that there exists no correlation between the X_{it} and individual effects if the Hausman test is significant. On the basis of the explanation, three models area fixed-effect model, random effect and ordinary least-square models has been used for the study under consideration.

4. EMPIRICAL RESULTS

This study identifies the factors like size, growth, non-debt tax shields, profitability, and tangibility which are important in choosing the optimum capital structure. This research study is based on the data taken from the state bank of Pakistan publication balance sheet analysis of oil and gas sector companies listed on the Pakistan Stock Exchange.

4.1 Descriptive Statistics

Table 1: Descriptive Analysis

Variable	FL	SZ	GR	NDTS	PF	TA
Mean	6.766	8.121	7.921	0.022	0.087	0.291
Median	3.820	8.078	3.472	0.022	0.056	0.202
Maximum	31.540	9.075	97.684	0.113	0.379	0.858

Minimum	1.290	7.281	-28.943	-0.013	-0.111	0.001
Std. Dev.	8.101	0.381	23.352	0.018	0.105	0.216
Skewness	1.883	0.659	1.634	2.045	0.721	0.803
Kurtosis	5.345	4.075	6.565	13.132	3.254	2.845
Jarque-Bera	46.733	6.868	55.558	283.517	5.096	6.183
Probability	0.000	0.032	0.000	0.000	0.078	0.045

Source: Author's Construction

In this table 1, the financial leverage has the lowest value 1.290 and maximum value 31.540 having average value of 6.766 and a standard deviation value 8.101. The mean value of financial leverage is 67.6% which shows that Pakistani companies use on an average 67% debt in businesses. Firm size has a lowest value of 7.281 and an extreme value of 9.075, have an average value of 8.121 and deviation from standard of 0.381, growth lies between -28.943 to 97.684 have mean of 7.921 and standard deviation of 23.352. Non-debt tax shields lies between -0.013 to 0.113 have an average of 0.022 and standard deviation of 0.018, profitability minimum and maximum values are -0.111 and 0.379 respectively with an average of 0.087 and standard deviation of 0.105. Tangibility lies between 0.001 to 0.858 having mean of 0.291 and standard deviation of 0.216.

4.2 Heteroscedasticity

The error term ' ϵ ' has homoscedastic or constant variance (Shah, 2011). In the situation, if the error term does not have constant variance or does not exist homoscedasticity, in that situation, it is called heteroscedastic. If heteroscedasticity is present then the errors may increase as the value of the heteroscedastic dependent or independent variables increases. Breusch Pagan/ Cook Weisberg test was performed for this study to check for the prevalence of heteroscedasticity.

Table 2: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.43072	Prob. F(5,50)	0.2296
Obs*R-squared	7.00922	Prob. Chi-Square(5)	0.0608
Scaled explained SS	15.2238	Prob. Chi-Square(5)	0.0094

Source: Author's Construction

It table 2 shows absence in the dependent variable leverage with the statistic that is Probability > Chi2 (5) = 0.0608. We are unable to reject the null hypothesis of homoscedastic standard errors in this case.

4.3 Correlation Analysis

This technique enables us to evaluate if the relationship strength between two variables can be measured in numerical terms. The result of the selected variables is indicated in table 3 of the correlation analysis. The condition in which the two more variables of the multiple regression model are linearly related at the extreme level then is called multicollinearity. According to the rule of thumb, if the value of the coefficient correlation is > 0.8. Such a higher value indicates the presence of multicollinearity. As per table 4 of the correlation, there seems to be the absence of multicollinearity as there is no single value that is greater than 0.8.

Table 3: Correlation Analysis

Variable	FL	SZ	GR	NDTS	PF	TA
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FL	1.000	-0.113	0.060	-0.053	-0.552	0.290
SZ	-0.113	1.000	0.215	0.225	0.122	0.254
GR	0.060	0.215	1.000	0.077	-0.088	0.218
NDTS	-0.053	-0.225	0.077	1.000	0.327	0.116
PF	-0.352	-0.122	-0.088	0.327	1.000	-0.095
TA	0.290	0.454	0.218	0.116	-0.095	1.000

Source: Author's Construction

Table 3 confirms that there is a negative correlation between the financial leverage and non-debt tax shields and profitability while the size of the firm, tangible assets, and growth have positive correlation with financial leverage.

The table 3 indicates that between tangibility and the size, there exists a positive relationship. This relationship is common, as the growing companies are generally inclined towards tangibility. Similarly, that there is a positive relationship between growth and size. This can also be explained by the fact that with the increase in size the company requires increased growth (i.e. increase in fixed assets). There is a negative correlation between growth and profit whereas growth and tangibility have a positive relationship. It is indicated that percentage change in the total assets can lead to the growth intangibility that changes in the percentage of a fixed asset.

4.4 Regression Analysis

The relationship between financial leverage and different factors is represented in table 4. The values of F-statistics of 172.456 ($P < 0.05$), 23.036 ($P < 0.05$) including 1.824 ($P < 0.05$) indicates that the independent variables have a mutual statistically significant relationship in the OLS, random effect, fixed effect models for explaining the financial leverage variation respectively. The R-square values 0.944, 0.884, and 0.151 indicate that there are 94.4%, 88.4%, and 15.1% variation of independent variables with financial leverage in the OLS, random and Fixed effect models respectively.

Table 4: Regression Analysis

Regressors	OLS		Random Effect		Fixed Effect	
	Coefficient	Std.Error	Coefficient	Std.Error	Coefficient	Std.Error
Size	-14.112***	1.317	1.251	17.888	-50.303	12.085
Growth	2.058***	0.151	1.162***	3.407	7.306***	2.948
NDTS	0.053	15.76	-0.086*	0.021	0.005*	0.021
Profitability	-4.321**	1.665	-2.107**	2.600	-25.477**	1.044
Tangibility	1.238***	0.372	1.1459	28.976	-7.810	11.269
R-square	0.944		0.884		0.151	
Adj. R- sq	0.938		0.846		0.068	
F-stat	172.456		23.036		1.824	
p-value	0.000		0.000		0.024	

*** Significant at the 0.01 level ** Significant at the 0.05 level *Significant at the .10 level

Table 5: Housman Test Summary

Correlated Random Effects - Hausman Test

Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	15.212401	5	0.1618

Source: Author's Construction

Table 5 is indicating the value of P is 0.1618 which is greater than 0.05. Thus this indicates that the result is significant confirming the random effect model is appropriate.

Table 6: Summary of Theories

Variables	Definition	Static Trade-off Theory	Pecking Order Theory	Agency Cost Theory
Size	The natural log of sales	Positive	Negative	Positive
Growth	Percentage change in total assets	Negative	Positive	Negative
Profitability	Ratio of net income before income tax over total assets	Positive	Negative	Negative
Tangibility	Ration of fixed assets to total assets	Negative	Negative	Positive

Source: Author's Construction

Leverage and profitability both have a negative relationship. This indicates that the firms that are profitable in Pakistan and are working in the oil and gas sector have a greater reliance on equity as compared to the debt. Therefore, it can be said that the higher profitability level abstains the firms from depending on the debt. These results can further be supported by the study of Tariq and Hijazi (2006) and Shah and Hijazi (2004)

A positive relationship was observed between financial leverage and tangibility. In the firms, the tangibility assets are the resources that the firms generate from the shareholder's equity and the fixed liability which also constitutes the capital structure of the company. In the fixed assets there is both type of assets that is tangible and intangible. Tangible assets of the company are the prominent source of capturing the debts as the tangible assets can be pledged in case if there is a need of securing a loan for creditors. The perception that underlies this is that the firms with a higher level of tangibility have the tendency to borrow loans at lower rates.

Financial leverage and size have a positive relation. This indicates that in Pakistan the smaller debt is more likely to deviate from the borrowings and the larger firms are more likely to get attracted towards borrowing. Thus this confirms the hypothesis that larger firms have higher leverage value. Also, this further supports the bankruptcy cost theory on financial leverage, according to which the fixed cost of bankruptcy constitutes of smaller portion as compared to

the combined firm's value. The larger firms do not have the fear of bankruptcy, and therefore they do not hesitate to take more debts.

The financial leverage and growth were found to have a positive relationship. This indicates that in Pakistan the growing firms have larger reliance on debt as compared to that of equity for financing new projects. The underlying reason behind this can be in order for the firms to grow in the oil and gas sector, they need a greater amount of cash. This need cannot be fulfilled through internal sources. Therefore, they opt for loans. This provides confirmation for a higher hypothesis related to growth opportunities. This is also backed by the research of Tariq and Hijazi (2006).

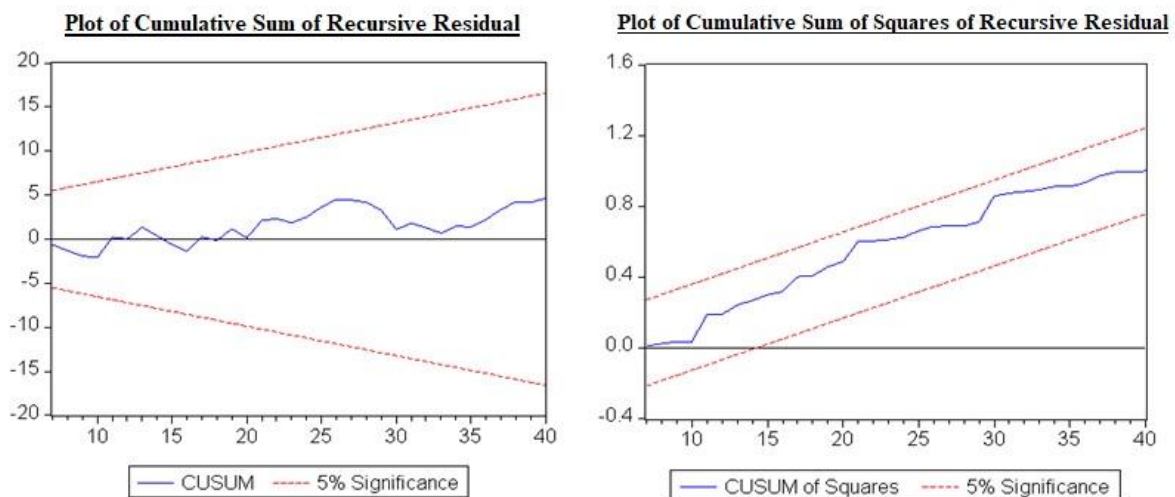
The relationship between non-debt tax shields and financial leverage is negative. According to the literature on the capital structure, it is indicated that the non-debt tax shields reduce the debt need to stop the income to go to a higher tax bracket. In Pakistan, the corporate tax is applied at fixed rates. Different rates apply to both the private and public sectors.

The estimation of the R-square in the random impact model is around 88%. It recommends that tangibility, size, profitability, growth, and non-debt tax shields show around 88% variety in the leverage. The leftover changeability in the leverage is because of some different variables which are excluded from the model. The R-square of the Shah and Hijazi (2005) was around 26% that shows that these factors are fit to show a 26% minor departure from the leverage of the Pakistani listed firms aside from the non-monetary firms. In their paper, they have recommended that these factors are not anticipating the significant impact on leverage. Nonetheless, the results of this paper are superior to the paper of Shah and Hijazi (2005), this model is fit to show the significant changeability on the listed firms of oil and gas of Pakistan.

The F-statistics shows that the model is significant on both 5% and even on the 1% and shows that the model is statistically significant.

4.5 Specification of Model

The CUSUM of Squares (Cumulative Sum of Recursive Residuals of Squares), and CUSUM (Cumulative Sum of Recursive Residual) were applied in this study. The results of the CUSUM of squares and CUSUM is presented with a 5% significance level that confirms that there is a correct specification of the model and the stability of the coefficients.



5. CONCLUSIONS

This study analyzed the capital structure determinants of the firms operating in the oil and gas sector of Pakistan using the panel data from 2013 to 2018. Results confirm that the relationship between the financial leverage and profitability of the firms operating in the oil and gas sector of Pakistan follows the pecking order agency theory hypothesis. It was further observed that the growth is correlated positively with the leverage. Considering the results, the study concluded that, the funds that are internally generated by the firms might not be sufficient for the growth of the firm. Therefore, debt financing might be the only option that can facilitate the firm's growth, which is consistent with the hypothesis of the pecking order theory. Additionally, the study has further validated the positive relationship between the financial leverage and the tangibility and negative relationship between the financial leverage and non-debt tax shields.

The analysis of the regression model further revealed that there is a negative relationship between financial leverage and independent variables i.e. profitability and non-debt tax shields. However, with leverage, growth, tangibility, and size have a positive relationship. It was further observed that the results of tangibility and size are not statistically significant. Due to the statistical insignificance, the study failed to determine any positive or negative relationship of tangibility and size with the leverage. Therefore, the hypothesis that is related to the size and financial leverage was rejected. Based on the statistical significance of the profitability, it can be said that leverage and profitability have a negative relationship. The hypothesis related to growth is accepted as the growth was found to be statistically significant. Thus it is concluded that the leverage and growth have a positive relationship of the listed firms operating in the oil and gas sector of Pakistan.

5.1 Implication of the Study

Different companies have different capital structures. Therefore, the capital structure and the related decision of every company is different as per its size and nature of business. The review of the literature indicates that tangibility and leverage have a positive relationship. Non-debt tax shield, growth, and profitability are statistically significant for leverage whereas the tangibility and the size are insignificant for leverage. Considering this, the managers of the company are advised to allocate their energy and time to the variables that have a significant relationship with the determinants of capital structure. This can help in minimizing the weighted average cost of capital which can, in turn, maximizes the shareholder's wealth.

The results of this study serve as the value-added addition in the empirical literature. The previous studies were generally inconclusive and were focused on different industries operating in different sectors and different parts of the world. It is, therefore, recommended that there always remains space for further analysis in the selected subject area. Further analysis can be conducted for analyzing the determinants of capital structure through using different factors and variables such as growth opportunity, capital adequacy, variability, GDP growth and taxation effect, country/industry level effects, and risk-weighted assets dividend payout and ownership structure, etc.

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Appendix

Concepts and Measurement of Variables

- Leverage (measured as B.V of Debt / B.V of Debt + B.V of Equity)
- Tangibility of assets (measured as Total Gross Fixed Assets/ Total Assets)
- Firm Size measure (measured as Log of Sale)
- Growth (measured as Annual Percentage Change in Total Assets)
- Profitability (measured as EBT/Total Assets)
- Non-Debt Tax Shields (measured as Annual Depreciation Charges Divided by Total Assets)