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Economic Growth, Capital Structure, and Oil & Gas Regulatory Authority (OGRA)

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Abstract: The petroleum sector is one of the key industries of all the oil exploration economies, including the USA, Saudi Arabia (other Gulf countries), Malaysia, and Pakistan. The petroleum industry has gained importance around the globe due to a huge level of economic support in such industries as power generation, shipping, automobiles, arms & ammunition, and airplanes. This research aims to examine the impact of profitability, growth, and leverage on return on assets (ROA). The main objective of this study is to evaluate how the petroleum industry is fostering the economic growth of Pakistan. The petroleum industry data are collected from all the oil & gas firms listed on the Pakistan Stock Exchange (PSX). The collected data were analyzed using the Panel data regression approach. This study concludes a significant and positive relationship between net profit margin, operating profit margin, and firm performance, whereas leverage and growth harm firm performance. This research is highly effective for oil and gas firms to enhance their performance by maintaining the optimal combination of capital structure and some other firm characteristics. The current study contributes to the capital structure for the oil and gas firms listed on PSX. It also indicates the trends of economic growth and other factors considering capital structure.

Keywords: performance, capital structure, net profit, leverage, growth.

经济增长、资本结构和石油和天然气监管局 (OGRA)

摘要： 石油部门是所有石油勘探经济体的关键产业之一，包括美国、沙特阿拉伯（其他海湾国家）、马来西亚和巴基斯坦。由于发电、航运、汽车、武器弹药和飞机等行业的巨大经济支持，石油工业在全球范围内变得越来越重要。本研究旨在检验盈利能力、增长和杠杆对资产回报率(资产回报率)的影响。本研究的主要目的是评估石油工业如何促进巴基斯坦的经济增长。石油行业数据收集自在巴基斯坦证券交易所(PSX)上市的所有石油和天然气公司。使用面板数据回归方法分析收集的数据。本研究得出的结论是净利润率、营业利润率和公司业绩之间存在显著的正相关关系，而杠杆和增长会损害公司业绩。这项研究对于石油和天然气公司通过保持资本结构和其他一些公司特征的最佳组合来提高其绩效非常有效。目前的研究有助于在 PSX 上市的石油和天然气公司的资本结构。它还表明考虑到资本结构的经济增长和其他因素的趋势。

关键词： 业绩、资本结构、净利润、杠杆、增长。

1. Introduction

Capital structure is the mixture of short-term debt, long-term debt, equity, and other ways to fund its assets. Capital structure is the method of how a company runs its overall functions. A crucial part of the company's structure needs critical analysis. Capital

structure is the base of other operations related to corporate finance. Capital structure is defined as a balanced combination of debt and equity [22]. The optimal capital structure is a combination that can decrease costs and increase the firm value [38]. Previous studies define that firms try to use pragmatic

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techniques to form capital structure with productive strategies which can be adaptive to the fluctuating conditions of the market.

The capital structure consists of different financial liabilities related to the firm. Financial capital is a very important part of the firm, which allows the investors to have control over the different operations of the firm. As stated in [29], debt and equity are among the main investment alternatives that almost all firms utilize to back most operations. Moreover, the capital structure does influence the shareholder position in company affairs. The purpose of capital structure is to decide how much and what type of funds a company can raise. The capital structure choices have a prominent effect at the firm's micro and macro levels and enhance the firm's productivity [27]. Marginal cost and marginal benefits equally are known as optimized capital structure.

The Oil & Gas Regulatory Authority (OGRA) is the Petroleum sector of the Government of Pakistan, responsible for regulating the oil and gas sector in Pakistan. In Pakistan, different finance suppliers have many choices to invest in different sectors. Amid them, Oil & Gas sector is one of the most efficient and dependable choices because of its valid and positive performance in the market. Pakistan is full of natural resources, and the Oil & Gas sector plays a vital and remarkable role in its economy. The Oil & Gas sector has noticed a wide growth since 1947 when there were hardly any Oil reservoirs. After fifty years, they discovered huge un-coverings that uplifted the economic condition of Pakistan. In 1992, when new exploration and production policies were introduced, it was the first time that this industry gained the interest of the investors, and from time-to-time changes in policies were made, which made this sector a huge success [7]. Nowadays, many companies are working with this sector and giving their best in the economic development of the country as well as new opportunities to the investors.

Capital structure and firm performance relationship are defined in many kinds of research, and it plays a vital role in a firm's strategic decisions [1]. The debt portion in capital structure predicts that the firm will have positive and good performance in the future. The equity portion signals future unsatisfactory performance. Every option has mixed and different outcomes for the performance of a firm. The multiple theories, including agency theory, pecking order theory, trade-off theory, and information symmetry theory, highlight their relationship. The optimum Capital structure helps manage and enhance the firm's performance successfully and makes sure that the firm accomplishes its scheduled objectives efficiently. Capital structure is dynamic, and it defines that every company has different debt and equity portions because each firm can change its combination in a way to reduce their agency cost and increase firm value and

performance [39]. Modigliani and Miller explained other scenarios to distinguish the dissimilarities in the debt-to-equity ratio of two different firms defined in leverage irrelevance theory.

Profitability is defined as the firm's capacity to earn potential revenues. A profit is measured by subtracting all the costs and expenses from the total revenues of the firm. Profitability is an important determinant in both compromise theory and hierarchy theory. Profitability could be explained as the potential or happening of achieving monetary gain, and most of the time, it is reflected through price/earnings ratio and other profitability ratios [38]. As indicated by the trade-off theory, productive firms can exploit bigger tax-shield, and the pecking order recommends that productive firms can rely upon inside financing [9]. A profitable firm adds more obligation to its capital structure as it has a higher ability to pay interest costs, expanding its tax yield.

The growth of a firm over some time is defined as firm growth. Two types of firm growth are internal and external. Some firms grow remaining in a single business direction, while other firms grow their activities through diversification. In this strong and competitive environment, the capital structure holds an important position for the firm's stable and progressive nature growth [32]. Firm growth is measured as a change in sales, total assets, and operating income. For several scholars, business growth has been an area of study. The literature recommends that the presence of growth openings builds an association's financial performance. Growth rate can be measured as the growth or change in total annual sales of a firm [3]. Agency theory explains that a firm having a high growth rate will be a low leveraged firm. Companies with high growth opportunities will harm the market because they use limited debt to finance their operations.

The problems faced by oil and gas firms are determining an optimal capital structure combination to increase the firm's value because more debt will generate higher risk and a decrease in wealth. In contrast, more debt will lead to issuing shares and paying a larger amount of tax [4]. The problem being investigated in this research is to evaluate the impact of capital structure with its different combinations on a firm's value and performance [31]. The firm must prepare the right blend of capital structure determinants to gain maximum returns and profitability [30].

The Pakistan GDP declines due to poor governance and a bad combination of capital structure (Figure 1). The Petroleum industry is considered one of the main sources of economic growth and development in Pakistan. The contribution of the Petroleum sector remains dynamic to the GDP over the years 2015 to 2020. This trend shows that oil and gas companies maintained their position in the economy towards growth. Hence, financial managers ought to carefully

choose the ideal Capital Structure to maximize shareholders' wealth and the firm's performance. The

study aims to test that how the petroleum industry is fostering the economic growth of Pakistan.

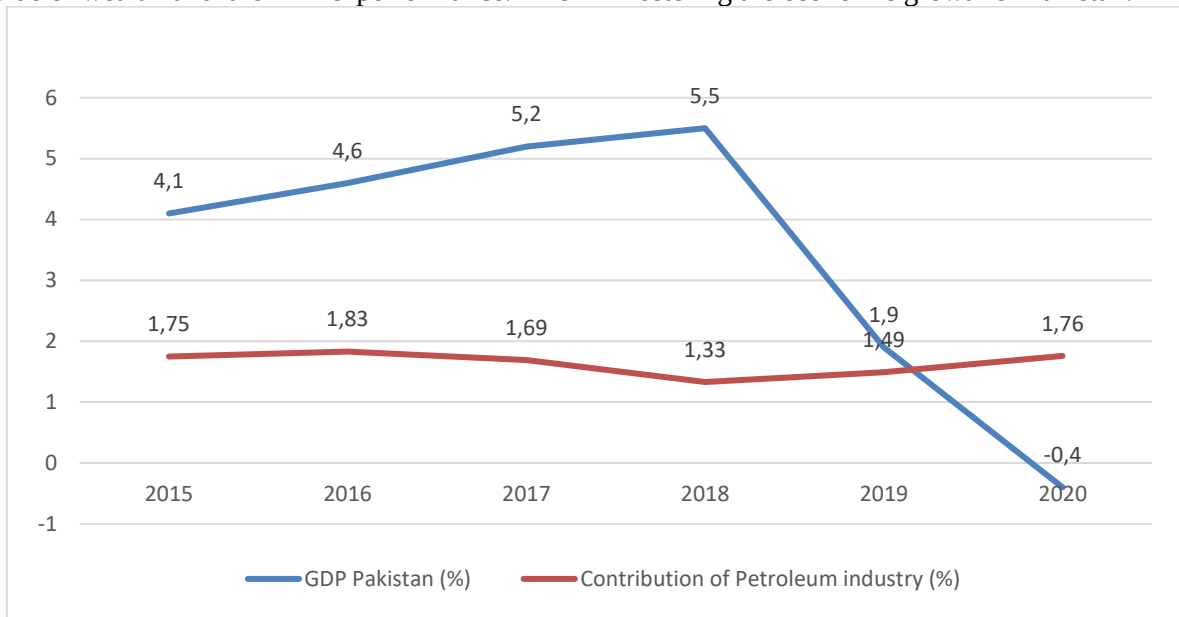


Fig. 1 Contribution of Pakistan petroleum industry to GDP (2015-2020)

2. Literature Review

The importance of capital structure with the performance of a firm and other specific factors has been highlighted by different researchers with time [12]. Moreover, it is explained and discussed theoretically and empirically that firm characteristics and some external country factors influence its capital structure [20]. The relationship between capital structure and firm performance is affected by the main point of origin of the firm. [14] describe a negative relationship between firm structure and firm performance while researching Malaysian firms. According to [23], their research explained that capital structure harms firm performance because when a firm's debt portion is not effective, the performance or value will be decreased. [14] find that there is no relationship between corporate governance and firm performance.

Some researchers [21] identified a positive relationship between leverage and firm performance, while others describe a negative or no relationship between them. [23] state that there is a negative relationship between capital structure and firm performance. Similarly, [35] studied a positive relationship between debt financing and firm performance. As stated by [2], the firm's debt portion is inversely related to the firm performance in developing and developed countries. The study asserts that defining suitable governance practices to enhance the capital structure will increase the performance and growth of the firm [15].

Firm performance and profitability are an important part of a company and the country's economy. [8] uses ROA as the firm performance measure. Apart from this, almost all the researchers state a positive relationship between profitability and

firm performance because both are interrelated to each other. Firms with high profitability use a high level of debt, which increases their performance and value in the market. The firms whose profitability is high and which have a steady and growing nature will positively affect the firm's performance, and it will also increase its value. For instance, [38] explains in his research that profitability influences a firm's value or performance, and there is a significant positive relationship between them.

Sales growth is measured by the percentage change in sales of the current and previous year. It is to be claimed that the high growth in sales anticipates high firm performance. [28] believes that growth is also used as an important determinant of firm performance. They conclude that when sales growth is high, the company automatically generates profit, indicating higher sales growth higher profitability. [12] states that there is a positive relationship between sales growth and firm performance, indicating that the firms will enhance their performance or profitability by increasing their sales. It is defined that growth has a positive impact on firm performance because of the excessive income company is producing. According to [23, 40], growth has a positive impact on firm performance. [19] derived from their research that Growth has a positive impact on firm performance. As stated in [37], there exists a positive relationship between sales growth and firm performance

3. Methodology and Theoretical Framework

The current study uses secondary data to investigate the impact of firm characteristics and capital structure on firm performance. The research area is the Oil & Gas sector of Pakistan [16]. All the

Oil & Gas exploration companies listed on the Pakistan stock exchange (PSX) are considered for the present study. The panel data technique is utilized, and a period from 2015 to 2020 is taken into consideration. The sample financial data is collected from annual audited reports (financial statements, income statements). Below in Table 1 are the names of organizations that have been tested for empirical analysis:

Table 1 Companies' names

Company	Sector
Mari Petroleum Company Ltd. (MARI)	Oil & gas exploration
Oil & Gas Development Company Ltd. (OGDC)	Oil & gas exploration
Pakistan Oilfields Ltd. (POL)	Oil & gas exploration
Pakistan Petroleum Ltd. (PPL)	Oil & gas exploration

Pecking order theory is reviewed as one of the most crucial and compelling theories to define capital structure and practices. It defines three different financing sources: internal sources, debt, and equity. According to the theory, the highest priority for the firm is internal financing before going for other sources. However, if funds are not enough, the firm goes for debt, and lastly, it goes for equity [18]. With the pecking order theory, if an organization is financing through internal funding, it indicates that the firm is in a strong position. However, if the firm goes for debt financing, it indicates that the firm is in a good financial spot to pay off its liabilities [30]. According to pecking theory, there exists a negative relationship between leverage and the profitability of the firm.

Based on the literature review, leverage, net profit margin, operating profit margin, growth in sales have been statistically found to influence the firm's performance. Table 2 shows the numbers of variables are chosen in this study. All these firm characteristics are considered independent variables, and firm performance is considered a dependent variable. The relationship among these explanatory variables and the firm performance is hypothesized:

H1: Leverage has a significant negative impact on firm performance.

H2: Net profit margin has a significant positive influence on firm performance.

H3: Operating profit margin has a significant positive impact on firm performance.

H4: Growth has a significant positive effect on firm performance.

Table 2 Variable description

Variables	Measures
Dependent Variable	Return on Assets
Firm Performance	$\frac{\text{Net profit}}{\text{Total assets}}$ [7, 13, 17]

Independent Variables	Debt to Equity ratio $\frac{\text{Total debt}}{\text{Total equity}}$ [5, 18, 33]
Leverage	Net profit margin, $\frac{\text{Net profit}}{\text{Net sales}}$ [29, 25]
Profitability	Operating profit margin $\frac{\text{Operating profit}}{\text{Net sales}}$ [29, 25]
Growth	Growth/Change in sale $\frac{\text{Current net sales} - \text{Previous net sales}}{\text{previous net sales}}$ [3, 10, 36]

The regression model has been used for examining the reliance of dependent and independent variables [29]. Cross-sectional and time-series data is considered to identify the regression results [6]. The given researchers also used panel data in different studies [56]. Several previous empirical studies used a regression model to analyze the association between capital structure and firm performance [34]. The balanced data is used in this research to identify the results. The model consists of I cross-section units, denoted I =1, observe every one of T periods, t=1. It is written as I×T. The regression model is defined below:

$$Y_{IT} = a + \beta_{IT} + \epsilon_{IT}$$

In the above regression equation, ROA is the dependent variable. It is denoted by Y_{it} , and firm characteristics are the independent variable and are denoted by β_{it} , and the term ϵ_{it} is used for error term [6]. The regression model for this research paper is as follows:

$$ROA = a + \beta_1 DER_{IT} + \beta_2 NPM_{IT} + \beta_3 OPM_{IT} + \beta_4 GRT_{IT} + \epsilon_{IT}$$

4. Empirical Results

The Panel Procedure

Pooled OLS Estimates

Dependent Variable: Return on Assets (ROA)

Table 3 Model description

Estimation Method	Pooled
Number of Cross Sections	4
Time Series Length	6

Table 4 Fit statistics

SSE	146.9993	DFE	19
MSE	7.7368	Root MSE	2.7815
R-Square	0.3630		

In Tables 3 and 4, regression results for return on assets demonstrate that the value of R^2 0.3630 tells that firm's characteristics explain 36% of the variability of firm performance. The value of SSE, which is closer to 0, indicates that the model will be more helpful for the prediction, but it is not still helpful because the value is far greater than 0. Therefore, MSE (7.7368), DFE (19), and Root MSE

(2.7815) values will be used for the prediction where the value is closer to 0, which indicates that the model fits the data.

Table 5 Parameter estimates

Variable	Estimate	Std Error	t Value	Pr > t	Label
Intercept	8.684067	4.067	2.13	0.0460	Intercept
NP	-0.34302	0.2638	-1.30	0.2091	NET PROFIT
OPM	0.334109	0.1571	2.13	0.0468	OPERATING PROFIT
GTH	-0.00272	0.0314	-0.09	0.9319	GROWTH
DE	-0.00294	0.00665	-0.44	0.6630	DEBT EQUITY

* At 5% significance level

Pooled OLS technique is used to provide the analysis about the baseline. After looking at (Table 5) from this analysis, it is concluded that Operating Profit Margin as a measure of profitability is significant and influences the firm's performance. Moreover, the parameter estimates of the explanatory variables (NP, GTH & DE) are negative. They have an indirect relationship and Positive for OPM, which explains that they directly correlate between firm characteristics and firm performance.

The PANEL Procedure

Panel Data Regression

Fuller and Battese Variance Components (Ran One)

Dependent Variable: Return on Assets (ROA)

Table 6 Model description

Estimation Method	Ran One
Number of Cross Sections	4
Time Series Length	6

Table 7 Fit statistics

SSE	47.5265	DFE	19
MSE	2.5014	Root MSE	1.5816
R-Square	0.5485		

Tables 6 and 7 show regression results for return on assets demonstrate that the value of R^2 0.5485 tells that 54.85% of the variability of firm performance is influenced by firm characteristics. The value of SSE, which is closer to 0, indicates that the model will be more helpful for the prediction, but it is not still helpful because the value is far greater than 0. Therefore, MSE (2.5014), DFE (19), and Root MSE (1.5816) values will be used for the prediction where the value is closer to 0, which indicates that the model fits the data.

Table 8 Hausman test for random effects

DF	m Value	Pr > m
4	0.14	0.9976

Panel data regression analysis was also used in [33]. In the case of Oil & Gas companies, the P-value from the Hausman test in Table 8 demonstrates that the null hypothesis cannot be rejected, hence suggesting the presence of a random effect model.

Table 9 Parameter estimates

Variable	Estimates	Std Error	t Value	Pr > t	Label
Intercept	4.475633	3.3417	1.34	0.1963	Intercept
NP	-0.13327	0.1777	-0.75	0.4624	NET PROFIT
OPM	0.27514	0.1098	2.51	0.0215	OPERATING PROFIT
GTH	-0.00481	0.0192	-0.25	0.8047	GROWTH
DE	-0.00497	0.00707	-0.70	0.4899	DEBT EQUITY

In Table 9, the operating profit margin is significant and thus influences firm performance. Moreover, the parameter estimates of the explanatory variables (NP, GTH & DE) are negative. They have an indirect relationship and Positive for OPM, which explains that they have a direct relationship between firm characteristics and firm performance. T value of the Operating profit margin is 2.51, which is the highest in this table. It describes the most influential variable. If there is 1 unit of OPM changes, then 0.27514 unit of firm performance will change according to trade-off theory and pecking order theory.

Table 10 The means procedure

Variable	Label	Mean	Std Dev	Minimum	Maximum
YR		2017.50	1.7445568	2015.00	2020.00
ROA		12.9475000	3.1675217	8.6100000	20.7000000
NP		35.3637500	5.7970763	21.5100000	45.2800000
OPM		50.1483333	9.9464049	31.2900000	69.8800000
GTH		10.4866667	22.9353825	-23.5500000	46.1500000
DE		113.0945833	113.4923834	21.0600000	471.0900000

Table 10 shows variables in which the total number of observations, means, standard deviation, and minimum and maximum values of all PSX listed oil & gas firms. In this result debt to equity ratio has 113.094583 of standard deviation, which signifies that leverage is highly unpredictable and unstable at different periods of all the oil and gas companies. Furthermore, its inconsistency ranges from the mean in which it falls is from 21.06 to 471.09. Growth in sales has the second-highest standard deviation of 22.9353825, which also signifies an unstable nature and ranges from -23.55 to 46.15. Return on assets has the lowest standard deviation of 3.1675217, which signifies that it is very stable and predictable for the companies and ranges between 8.61 to 20.70, which describes a low change from its mean. Net profit margin and operating profit margin have a normal standard deviation, which signifies that it may change due to some circumstances in the future but that change will be less.

Table 11 Pearson correlation

Pearson Correlation Coefficients, N = 24					
Prob > r under H0: Rho=0					
	ROA	NP	OPM	GTH	DE
ROA	1.00000	0.33807	0.51017	-0.11618	-0.35752
	0.1061	0.0109	0.5888	0.0863	
Continuation of Table 11					
NP	0.33807	1.00000	0.90964	0.24693	-0.15527
	0.1061	<.0001	0.2447	0.4688	
OPM	0.51017	0.90964	1.00000	0.10531	-0.32395

	0.0109	<.0001		0.6243	0.1225
GTH	-0.11618	0.24693	0.10531	1.00000	0.49271
	0.5888	0.2447	0.6243		0.0144
DE	-0.35752	-0.15527	-0.32395	0.49271	1.00000
	0.0863	0.4688	0.1225	0.0144	

Table 11 shows the correlation between the firm characteristics and firm performance variables. The Debt to equity (DE) with (-35.75%) is negatively correlated with firm performance measure return on assets ROA. It shows that when a firm uses a more debt-to-equity ratio, its Return on assets will be low and vice versa. The growth in sales (GTH) with (-11.61%) is also negatively correlated with ROA, which indicates that if growth increases, then ROA will decrease and vice versa. Moreover, net profit (33.80%) and operating profit margin (51.01%) are positively related to firm performance. Moreover, operating profit margin is the only variable that is significant in this research.

5. Conclusion

This study aims to find the impact of firm characteristics and capital structure on firm performance of the Oil & Gas sector of Pakistan or to explain the relationship among them. In this research, four Oil & Gas companies listed in the Pakistan stock exchange are taken into consideration. Firm performance is measured by ROA and other firm characteristics, and their measures are leverage (Debt to equity ratio), Profitability (Net profit margin and operating profit margin), and Growth (Change in sale). This research combination could also help society by providing a lower cost of energy for consumers. Capital structure supports the firm to increase their profits and shareholders' wealth while minimizing the total cost of capital. An optimal capital structure reduces the cost of financial resources, improves net economic returns, and increases equity value. Capital structure can lead the firm to enhance its overall returns and profits.

The above results enable us to conclude that there is a significant and positive relationship between operating profit margin and firm performance, in line with [25]. A higher or positive operating profit margin indicates that the company is generating profits and controlling its costs which helps the firm to be efficient and stable in the market. Net profit margin is also positively related to firm performance. At the same time, leverage and growth negatively affect firm performance. Growth is changing rapidly, which indicates that the firm's agency cost will also be high, which can be normalized by choosing the right combination of capital structure to enhance the firm's performance [28]. These results interpret that the capital structure of Pakistan's oil and gas sector is highly unpredictable and cannot be predicted. However, these capital structure choices lead the sector to remain profitable in GDP, and their

performance is almost constant and leading towards growth. The current study uses only one dependent variable (Firm performance). Future studies can include two other variables like ROE and Tobin's Q. Lastly, only one moderating variable is selected, so more moderators can be added in future research. Future researchers can take more and six years of data to get more accurate results. The current research is limited to Pakistan's oil & gas sector, but future research could extend to multiple sectors like the cement, automobile, food, and personal care.

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